THIS WEEK IN THE
IRON AGE

Vol. 158, No. 2 July 11, 1946

Editorial

o o o

Technical Articles

o o o

Features

o o o

News and Markets

o o o

Ryerson Ingenuity Provides Service

Despite Steel Shortage!

It is true that today many kinds and sizes of steel are not always immediately available and there will be many of your inquiries and orders we cannot handle. But your Ryerson salesman knows the ins and outs of steel procurement and it is surprising what can be accomplished by close cooperation between us.

We may be able to suggest an alternate type or analysis that will serve, or a larger size that can be cut or machined to meet your requirements. Flame cutting or forming, welding and other fabricating processes often enable us to come through and help you complete a needed product.

We believe the steel shortage may ease somewhat during the coming months. But in the meantime we want you to know that our whole organization is carrying on; doing everything within its power to help every customer secure the steel he needs. We urge you to keep in touch with us.

RYERSON STEEL

Joseph T. Ryerson & Son, Inc., Steel-Service Plants: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston

THE
IRON AGE

ESTABLISHED 1855

o o o

July 11, 1946

o o o

Self Control or Police Patrol?

DURING these hot days it is well to dwell upon consoling thoughts. One such, which also has a current interest, is that if you behave yourself you will never ride in a patrol wagon.

Unless Congress intervenes before this is published and restores some measure of price and wage control, we are going to rediscover how well industry and business can behave, now that the cop has left his beat on Price Avenue.

This may well settle the long standing controversy between the National Association of Manufacturers and the OPA as to whether an unfettered economy is better than a regulated one in times such as these when demand exceeds supply.

I can hardly think that the makers and sellers of goods would be unintelligent enough to price themselves out of their market and at the same time to sell their future freedom by indulging in an orgy of price rises just because the policeman has left for the time being. Because if they make too much disturbance on Price Avenue during his absence somebody will blow a whistle and not one but a whole wagon full of cops will be back on their necks.

Most of us who are in industry or business are and have been opposed to the ideas of a planned economy. We do not like to have economic policemen shadowing us and regimenters telling us we must do this or cannot do that. We prefer to run our own affairs in the traditional American way, and many of us believe that the leaders of our industries and businesses have arrived at a maturity of economic thinking that concedes that the consideration of public interest is the first factor to deal with in forming the policies of private enterprises.

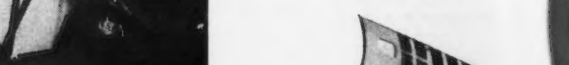
So now we have an opportunity to do one of two things. We can either demonstrate that we have the necessary self control to avoid policing or we can make clear to the public that they had better call back the cops. There is no other possible course. Unfortunately we are under a handicap in this demonstration of self control for the reason that business and industrial management alone cannot manage price. Control of wages which are a principal factor in price has not been in the hands of management for some years.

Another handicap is that because of wage increases and other factors, an upward price movement has been in effect for months. The existence of OPA did not and could not check it and its demise will not eliminate it.

Because of these handicaps and of the high stakes involved we must exert even greater effort to hold prices in line than would otherwise be required. And when and if upward adjustments are necessitated, the reasons for such action should be made widely known to the public.

Examination of the spectrum emanating from the vaporization of the steel sample in an electric arc quickly reveals the chemical content of the sample.

A spectrographic film provides a permanent record of each sample.



How the Spectrograph Helps Maintain Inland Quality

Every open hearth heat run at the Inland mills is checked not only by routine control methods of chemical analysis, but also in a special spectrographic laboratory.

Inland was one of the first steel mills in America to install and develop technique for using the spectrograph in control of quality. An important advantage of this method is the rapidity with which tests can be made. At any stage during the working of a heat a melter can have an accurate check on the chemical content within ten minutes after a sample is delivered to the laboratory. Not only do these frequent and rapid tests assure the uniform high quality of Inland steel, but they also help maintain capacity production—a vital necessity in this time of war.

The spectrographic analysis is only one of the many checks and balances used by Inland in the production of steel—it is only one of the numerous quality control methods adopted by Inland after rigid tests prove their practicability.

INLAND STEEL

INLAND STEEL CO.

38 S. Dearborn St., Chicago 3, Ill.

Sales Offices: Cincinnati • Detroit • Indianapolis • Kansas City • Milwaukee • New York • St. Louis • St. Paul

► Philip Murray, head of United Steelworkers of America, will stick to his promise of no new wage demands during the life of the present contract. But if living costs have spiraled when the contract comes up for renegotiation prior to Feb. 15, 1947, it is certain that he will demand a healthy wage jump.

► The steel price picture may show its first break, aside from some marginal items like wire products, reinforcing bars and track supplies, in a repetition of a 1937 practice. In that year of heavy backlogs, with deliveries extended more than 6 months, certain companies accepted premiums for earlier deliveries.

► In a normal market, without OPA, producers are expected to revert to former practice of announcing prices a month before the beginning of each quarter. Among the increases looked for in 1947 is tinplate, producers of which were unable to take advantage of OPA price increase because of long term contracts. The advance may well be larger than that once approved by OPA.

► Copper, lead and zinc subsidies may be revived through action of western Senators who propose to transfer the former OPA subsidy setup to the RFC. Canadian producers are also seeking increases, claiming that their copper price is almost 50 pct below the world market.

► Secretary of Commerce Wallace states that since VJ-Day there has been a sharp increase in corporate mergers and the acquisition of small firms by larger ones. He views the situation as a threat to the nation's economy and lists steel among seven industries classed as the most "pronounced offenders."

► A large midwestern producer of sheets and tinplate reports an accumulated shortage to date of 300 box cars.

► The economies of flame cutting can now be applied to stainless steel by means of a fluxing process that eliminates the troublesome oxides at the point of cut.

Carefully controlled quantities of the powdered flux are dispensed from a hopper into a mixing chamber where it enters the cutting oxygen stream. The addition of a simple flux feeder to standard oxyacetylene cutting equipment permits clean, smooth cuts to be made economically especially in the steel producing mill and foundry.

► Increased production and fewer rejections of electroplated or anodized aluminum parts can be achieved by the use of rinse water of zero hardness after alkaline cleaning prior to plating.

Rinse water of zero hardness and essentially free of iron, copper and manganese can be readily obtained by installing an inexpensive and easily regenerated cation exchanger in the main water supply.

► A method of recording changes in total magnetic and eddy-current losses permits detection of the beginning of plastic deformation due to overloading or fatigue in metals. It leads to practical application in the inspection of mine-hoist and similar cable.

► Aluminum alloy bearings and aluminum base bearings with steel backing are receiving considerable attention in Detroit where it is believed they will replace babbitt in many applications. Strength and fatigue characteristics are said to be excellent and cost is reported competitive with babbitt.

► Some British scientists have concluded that supersonic examination should be regarded primarily as a new instrument of investigation, capable of giving information about the internal character of masses of steel, which can not now be obtained any other way. But the method does not distinguish the bearing the observations may have on the material's suitability for a specific purpose.

► Nails declared surplus by WAA are being turned over to box makers to keep food moving, particularly that destined for UNRRA.

► American railroads, still seeking a freight rate increase above that recently granted, are greatly in need of new power, new cars and up to 2 million tons of rails.

► The British Minister of Supply has increased prices on Staffordshire pig iron, galvanized sheets, galvanized and fine sizes of wire, wire netting and steel castings. Ferrovanadium and high speed steel prices were cut and forgings and wire mesh decontrolled.

► If OPA remains dormant it is expected that export price increases, when they come, will be led off by the export merchants rather than the steel companies export subsidiaries. This has been past experience.

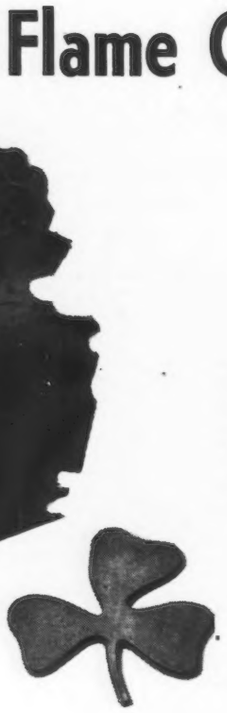
WAA establishment of export divisions in four more regional offices indicates exporters are showing more interest in surplus property. Sales from New York office have been running to more than $500,000 a month.

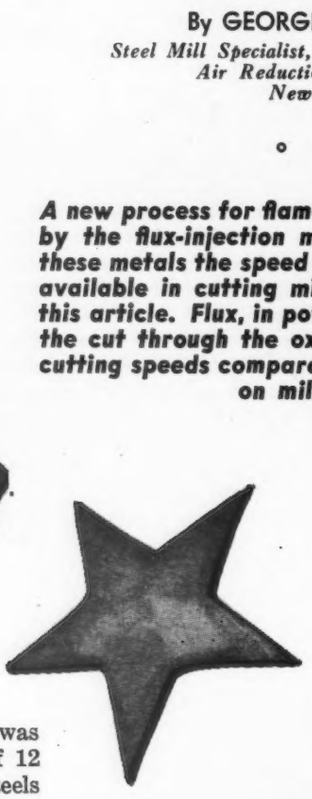
Flame Cutting Stainless Steel

By GEORGE E. BELLEW
Steel Mill Specialist, Technical Sales Div., Air Reduction Sales Co., New York

o o o

A new process for flame cutting stainless steels by the flux-injection method, which brings to these metals the speed and economy previously available in cutting mild steel, is discussed in this article. Flux, in powdered form, is fed into the cut through the oxygen stream permitting cutting speeds comparable with those obtained on mild steel.





o o o

QUALITY and versatility of the flux-injection cutting method is illustrated by these shapes cut from stainless with an Oxygraph unit.

o o o

SINCE the broad field of corrosion resistance was opened to steels through the introduction of 12 pct Cr bearing steels around 1910, stainless steels have been developed and designed to meet specific problems until the stainless group can now boast of many characteristics which fit well into the requirements of this high speed, mass production era.

Stainless steel is used extensively where resistance to corrosion is required but it is in competition with other classes of steel because of their lower cost and ease of fabrication. There is a growing belief, however, that in spite of its higher initial cost, the use of stainless in certain fabrication work might actually reduce overall costs because of its inherent characteristics and particularly in the elimination of certain finishing processes. Unfortunately, material cost is not the only factor involved. Before a material can be processed in competition with others of a similar nature and before it can be introduced efficiently to the production line, it must be adaptable to modern production methods and be capable of being handled by efficient equipment and tools. In steel mills, foundries and fabricating shops modern methods of fabrication lean heavily on the oxyacetylene cutting process for shaping materials. However, to date the flame has not been able to cut and shape stainless steels economically.

The recent adaption of the oxyacetylene cutting process to enable it to handle stainless steels has opened broader fields to these steels as an industrial material while at the same time making possible reductions in its fabrication costs and eliminating the necessity for costly equipment heretofore required for severing and shaping chromium bearing alloys.

Up to the present day stainless steels have been shaped by means of mechanical methods and by the carbon arc. Carbon arc cutting is a melting process and is used for severing or piercing heavier thicknesses where poor finish and local loss of corrosion resistance may be tolerated in the interest of severance. The mechanical methods of sawing, shearing and punching are generally competitive in working light gage material but become comparatively costly

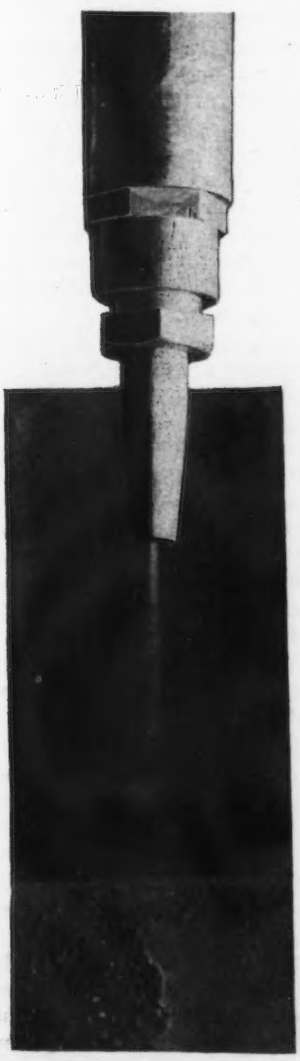
on heavier sections. Their use on thicker material has been necessary as the only methods of producing cuts without destruction of the desirable properties of the steel. To fill these requirements, for instance, drilling is used not only to produce round holes, but also in combination with machining to cut shapes. Shape cutting by nibbling is in some cases more efficient than drilling and machining but certainly cannot compete with the flame as applied to mild steels. With the possible exception of work on light sheets all these methods are comparatively costly and do not lend themselves to modern steel fabrication techniques.

An earlier investigation of flux-injection method of cutting stainless is described in "Gas Cutting of Stainless Aided by Fluxing System," THE IRON AGE, Aug. 9, 1945, p. 61.—Ed.

Many attempts to cut stainless steels by means of the oxyacetylene flame have failed. The reason for this failure lies in the fact that at the very inception of the cut, the elements (principally chromium) which give stainless steels their desirable properties form oxides whose melting points are so high that they become and remain a solid film which stops further oxidation.

Various methods have been tried to overcome this difficulty. Rough severing cuts have been made in thin sections by melting the steels with a heating flame, using a weaving motion of the torch to hold the kerf open as the cut progresses. This method has been varied by employing a heavy preheat cutting tip and using the oxygen stream to blow the molten metal out of the kerf. This same principle of providing additional heat to the cut was also applied by placing a mild steel waster plate over the stainless material. By cutting the waster plate first, the heat from the cutting of the mild steel assisted in the severance of the stainless steel beneath. On thinner plates, where the mass of the mild steel is comparatively large, rough cuts are possible by this method, although rather expensive. Clad steels may be cut in this manner by starting the cut from the mild steel side of the plate.

FIG. 2—The Flux-Feeder unit is a portable hopper-dispenser. Control panel has a rheostat for controlling the flux flow and a receptacle for a remote control extension to permit control of flux flow at the point of torch operation



LEFT

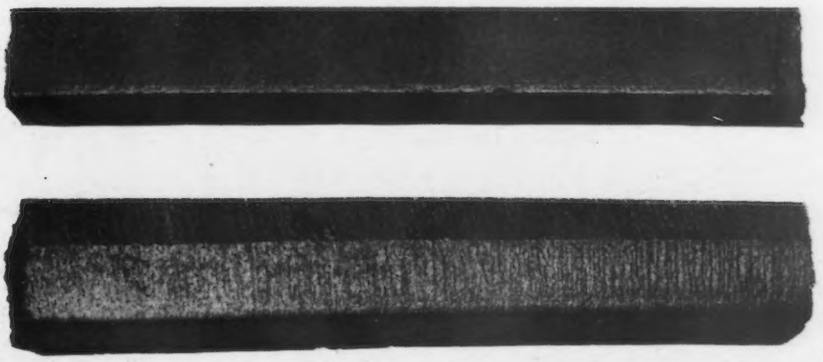
FIG. 1—Cutting flux, delivered to the torch from the automatic dispenser, is shown here being discharged in the oxygen stream through the cutting tip to the cut.

o o o

BELOW

FIG. 3—Typical flame cuts on 2¼ in. 18-8 stainless steel. The cut surfaces have not been cleaned except for the usual wire surface. Degree of cut control possible with this method is illustrated in the bevel cut (bottom) by the straight line intersection of the bevel cuts.

Another application of the iron combustion principle was the use of filler rods of steel melted under the preheat flames of the cutting tip. In all of these experiments the method of approach of using additional heat from large preheating flames or from the combustion of mild steel with oxygen did not attack the source of the problem, that of the removal of the troublesome chromium oxides from the cutting face. As a result, melting cuts rather than oxidation cuts



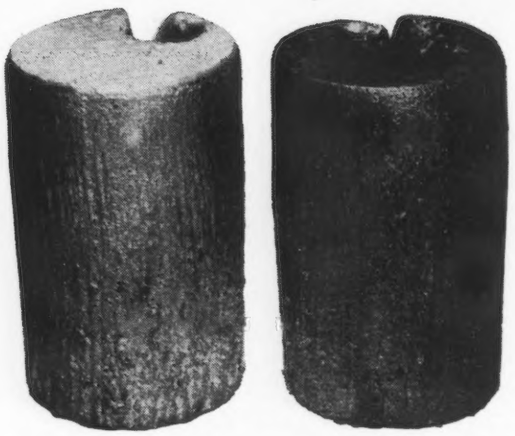


FIG. 4—Plugs of 3¼ in. diam cut from 3⅞ in. thick plate by the flux-injection method. Note the difference in cut quality between the periphery, cut by the flux-injection method, and the starting hole which was pierced by the carbon arc.

were obtained, and, in general, speeds were slow, quality poor, and, with the possible exception of certain operations on clad steels, the operation was uneconomical in comparison with existing mechanical methods or the carbon arc.

The recent invention of a fluxing process which eliminates the troublesome oxides, first suggested by George E. Linnert of Rustless Iron & Steel Co., together with the development of a practical method of applying the flux, has made possible the cutting of stainless steels by oxidation and has actually brought the economies of flame cutting to this useful material.

In using this new method a flux, in powdered form, is dispensed in carefully controlled quantities from a hopper into a mixing chamber where it enters the cutting oxygen stream. The flux, injected into the cutting oxygen is thus delivered in selected quantities automatically and directly to the point of cut as shown in fig. 1. This addition of a simple flux feeder to standard oxyacetylene cutting equipment permits clean, smooth cuts to be made economically in stainless steels. A three-hose cutting torch, such as now used with standard flame cutting machines, is employed to avoid the injection of the flux into the preheating mixture.

The Flux Feeder unit, fig. 2, is a portable combination hopper and flux dispenser. The hopper has a flux capacity of 20 lb. The dispenser is a vibrator type which varies the amount of flux delivered by means of a rheostat control. This device gives a steady and accurately controlled rate of flux flow which is the important requirement in cutting stainless steel. A constant voltage transformer is incorporated to guard

TABLE I

Comparison of Factors Involved in Flame Cutting Stainless Steel and Mild Steel

Metal Thickness, In.		¼	½	¾	1	1¼	1½	2	2½	3	4
Speed, In. per min	Stainless Steel	12	11	10	9	10	9	8	8	8	7
	Mild Steel	20	17	15	14	13	12	10	9	8	7
Cutting Oxygen, Psi	Stainless Steel	65	65	65	65	60	65	65	65	60	75
	Mild Steel	30	40	40	50	45	45	50	50	50	60
Flux Consumption, Oz per min	Stainless Steel	¼ X	¾ X	¾ X	1 X	1 X	1¼ X	1½ X	1½ X	2 X	2 X
	Mild Steel										

power input against line voltage fluctuations and a remote control receptacle is installed to make possible the starting and stopping of flux flow from the point of torch operation or from any other convenient point.

In practical stainless steel cutting operations, the same principles are employed as are used in oxyacetylene flame cutting on mild steels. The one important difference is that, with the addition of flux, there enters another variable, the rate of flux flow.

Table I gives a comparison of the values of the variable factors involved as between mild steel and stainless steel flame cutting. The data for both stainless and mild steel cutting places emphasis on quality results rather than on speed. It should be noted that operating speeds and pressures given for the flux-injection method are on the conservative side. The efficiency of the flux-injection process is being continuously improved, as with all new processes, so that improvement in the efficiency of the process can be expected as experience adds to knowledge and technique.

Typical applications of the flux-injection method of cutting stainless steels are illustrated in the accompanying photographs. The straight line and bevel cuts, fig. 3, were made on 2¼ in. thick 18-8 stainless. The quality of the cuts obtained is indicated in the illustration. The control obtainable in cutting is shown in fig. 3 by the clean, straight line at the intersection of the bevel with the vertical cut. These cut surfaces were not cleaned except for the usual light wire brushing. Contrary to expectations based on experience with clad steels less slag is left on the surfaces of the stainless steel and particularly at the bottom of the kerf than might be expected in a similar cut on mild steel. High temperatures are not involved and the cut surfaces lose none of their stainless properties through burning or carbide precipitation when the stainless steel is suitably stabilized with titanium or columbium. The speed of cutting in these particular instances was practically the same as would obtain for quality cuts on mild steel of the same thickness.

The Oxygraph is a standard machine for cutting shapes in mild steel. Its counterpart, in stainless steel practice up to the present, has been the milling machine for nibbling out contours in plates. With the flux-injection method, the Oxygraph is now available as a shape cutting tool for stainless steel. Some shapes cut from 18-8 stainless steel are shown in fig. 1. No machining was necessary to finish these cuts as flame cutting and hand wire brushing left the surfaces as illustrated. The 3¼ in. diam plugs in fig. 4 were cut from 3⅞ in. plate and are especially interesting in that they illustrate the difference in cut quality between the flux-injection method used for cutting the periphery, and the carbon arc method which was employed to pierce the starting hole.

Stack cutting of light sheet metal is as practical for cutting stainless steel using the flux-injection method as it is with mild steel. In fact the air gaps between the sheets in the stack, which are difficult to avoid completely in most stack cutting operations, actually cause less difficulty in cutting stainless steel than mild steel and there is considerably less tendency for slag adherence. In stack cutting stainless steels it is recommended that a waster plate of mild steel be placed on top of the stack. This is not for the purpose of effecting the cutting operation, but to avoid spoiling the top sheet of the relatively expensive stainless steel

which it will show the greatest advantage and saving is in the steel producing mill and foundry. In such applications machine flame cutting can greatly simplify the removal of risers, as shown in fig. 5, and reduce costly grinding operations. Billets and other heavy shapes may be cut easily and efficiently with less waste metal, and made ready to roll or ship at a fraction of the cost now necessary.

Flame cutting of stainless steels is new and, as is true with any new process, experience alone can tell how well it will fit into the general picture of production and fabrication and how great will be the economies it will introduce. The preliminary applications of this process give reason to believe that it will find a broad field of use in shaping stainless steel parts for final assembly. Looking back at the effects of machine flame cutting on the production and fabrication of steel objects, it is certain that great changes will result in the methods of processing stainless steel in

o o o

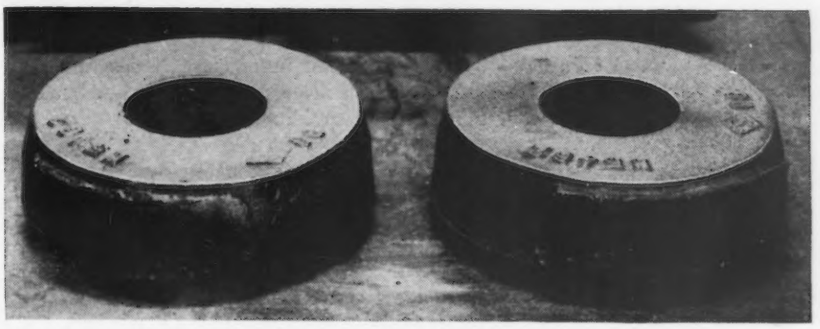


FIG. 5—Such applications as riser cutting in stainless steel castings offer particular opportunities for cost reductions with the flux-injection method. These illustrations show an 18-8 stainless casting before and after riser removal with a Radiograph.

o o o

which might otherwise be melted down by the cutting action. This melting down of the top sheet is difficult to avoid even in stack cutting mild steel because of the insulating effect of the air gap.

The most immediate application for the flux-injection method of cutting stainless steel and the point at general manufacture through the introduction of the flux-injection method. With the flame cutting process thus brought to bear on stainless steel this important structural material will find much wider application since it will now be possible to shape it with ease and economy.

Internal Friction in Drill Lubricants

EMPLOYING a chemical formulation built around molecular combinations having a minimum of internal friction, a maximum of lubricity, and the necessary extreme pressure characteristics to provide for efficient cutting, a new type of coolant designed especially for drilling has been developed by Dr. Johan Bjorksten, Chicago.

In drilling operations, three factors are predominant which do not influence other machining operations in even approximately similar degree, according to Dr. Bjorksten. In the first place, there is a tangential thrust due to the centrifugal action on the chips, and because of the rotary motion in the confined cylindrical bore hole, any particles freed will tend to be wedged by centrifugal strains between the edge of the drill and the bore. This results in increased friction with consequent heat formation, power loss, loss of tolerance, and even scoring.

Secondly, the coolant-lubricant layer fills an extremely thin, yet large area between the flute of the drill and the wall of the hole. This clearance is practically zero. Therefore, when the drill revolves, shear forces in this extremely thin coolant layer become enormous. This shear friction gives rise to heat, which in turn causes expansion of the metal and consequent squeeze on the upper portion of the drill. Thus, the internal molecular friction in the coolant becomes of crucial importance in drilling, according to Dr. Bjorksten.

Finally, heat dissipation in drilling is difficult because of the small cross section of the drill and the long distance through which the heat must travel.

To aid in overcoming these obstacles, the new compound, known as Drillyfe, includes ingredients that have a specific affinity to virgin metal surfaces, thus providing the chip with an adherent lubricant film. This film retards the tendency of micro-chips to wedge between the drill and the bore of the hole, and also speeds the elimination of chips.

By minimizing the internal friction of the lubricant as well as the chip friction, this compound strikes at the source of heat formation, which has long been overlooked in drilling. Usually mixed with water in the proportion of one part to 10 or 20 of water, it is claimed that production increases of from 20 pct to as much as 3000 pct have been made in some instances. Drillyfe is marketed by Bee Chemical Co., Chicago.

Calculating Coil and Burner Requirements for Gas-Fired

HEATING of liquids and soft metals by burning gas directly in tubes immersed below the liquid surface has been in general use for sometime. It has been necessary, however, in the design of gas-fired immersion coil installations, to collect data from a number of sources before obtaining all the information necessary for a satisfactory installation. Even the application of coils and burner equipment to existing tank installations requires a fair amount of searching for engineering data, plus some guessing on the side.

This article is adapted from a paper read before a meeting of the Midwest Industrial Gas Sales Council, Chicago, presented with the aim of revising and coordinating some of the previously presented engineering data, supported by proven field results, into a form which can be readily used in calculating pipe size and length, burner heat output, etc., to meet the performance characteristics of specific immersion heating applications. In this problem, as with any engineering problem, certain facts which govern the size and performance of the equipment should be determined before accurate calculations can be made. These conditions include such factors as tank construction, operating temperatures, properties of the material to be heated, the work load, type of burner equipment and the approximate operating efficiency. Collection of these data will be discussed more fully later.

For the purpose of this discussion, immersion heating may be defined as a method of heating where combustion takes place in a tube or coil immersed in the material being heated. This definition eliminates the use of "submerged combustion" where premixed air and gas are burned directly beneath a liquid surface without the use of an intermediate coil. This is a very satisfactory method for many types of solution heating applications but will not be covered in this report.

The chief advantage in the use of gas-fired immersion heating lies in the extremely high heat transfer rates which may be obtained, particularly when compared with the straight bottom-fired type of installation. All water base solutions, such as pickling, caustic, plating and rinse in the lower temperature range, organic solvent cleaners, such as trichlorethylene, cooking and vegetable oils, fats, waxes, heat treating salts, asphalt and soft metals can be economically heated by proper installation of gas-fired immersion coils. The application of burner equipment, plus piloting and flame failure safety devices, is greatly simplified as the burners are usually few in number and, if desired, may be grouped and the air-gas mixture supplied from a common mixing device. Also, flue connections can be easily made without a complex collector or hood.

This method of heat transfer as generally applied to the heating of liquids is quite simple. An air-gas mixture is burned in a tube backed by water or some other liquid. Heat released by the combustion is transferred into the liquid in two steps. The transfer between the flame or hot gases and the tube is primarily by conduction and convection with only a small amount of radiation. This heat is transmitted through the tube wall mostly by conduction and is passed on to the liquid again by conduction and convection.

There are numerous factors which affect the rate of heat transfer from flue gas to metal and from metal to liquid. The data below show the extremely wide range of heat transfer coefficients possible in the transmission of heat between metals and liquids.

Range of Heat Transfer Rates for Various Liquids*

*From *Heat Transmission* by W. H. McAdams

	Btu per sq ft per hr per °F
Water, boiling	300 — 9000
Water, heating, not agitated	50 — 3000
Oil, heating, not agitated	10 — 300
Air, heating	0.2 — 8.0

TABLE I

Maximum Burner Input, Coil Length and Btu per sq ft For Various Pipe Coil Sizes

Pipe Coil Size (Inches)	Atmospheric Burners			Open Blast Burners		
	Max. Burner Input Btu per Hr	Max. Coil Length in Ft	Heat Transfer Btu per Sq Ft of Coil Area	Max. Burner Input Btu per Hr	Max. Coil Length in Ft	Heat Transfer Btu per Sq Ft of Coil Area
2	26,000	6	6,500	115,000	13	13,000
3	63,000	12	5,400	230,000	18	12,000
4	100,000	16	4,800	320,000	22	10,700
6	170,000	20	4,100	465,000	26	9,300

(Based on 250° to 300° F. Differential Temp. Between Flue Gas and Liquid and 4 ft Stack Height)

Immersion Heating

By ROBERT M. BUCK
Engineer, Industrial Div., Bryant Heater Co., Cleveland

Essential engineering data for calculating size of immersion coil and burner input required for gas-fired immersion heating of liquids are given in this article. The author has correlated information not previously available at one source and has supplemented this with additional original material to make available all essential information necessary for determining coil and burner requirements. This information is applicable for pickling, plating and rinsing, solvent cleaning, waxes, soft metal, heat treating salts, etc.

The variations in the coefficients shown are dependent on several factors, such as the physical properties of the fluid being heated, the dimensions of the equipment, the velocity of the fluids past the interchange surfaces, the turbulence of the fluid and whether or not there may be a change of phase, such as in a steam boiler. It can readily be seen from the table above that the average transfer rates between air and metal are drastically lower than those between metal and liquids.

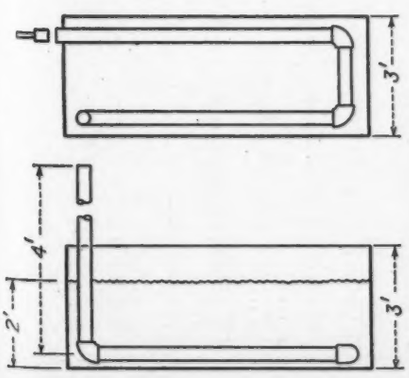
Suggestions have been made that externally finned tubing, which has a much higher exposed surface per lineal foot than standard pipe or tubing, should be used for immersion coils. From the previous data it is obvious that finned tubing should be finned not externally but internally to increase the gas to metal transfer surface. Water backed tubes have an almost unlimited rate of heat absorption when compared to the heat which it is mechanically possible to release within them by immersion firing methods.

The use of baffles or core-busters in immersion tubes has been investigated to some extent. There is a slight gain in heat transfer rate, especially when baffles are used with atmospheric burners in the larger sizes of pipe coils. Here the flame would normally tend to channel through the tube and leave an inert or cold film at the metal transfer surface. Baffles, however, have the disadvantage of reducing the maximum capacity of the coil by restricting the flow. If heat inputs less than the maximum for the coil size are permissible, then baffles can be used with beneficial effect.

In order to minimize the film effect it is suggested that the smaller coil sizes be used where possible. Table I shows the burner Btu input, maximum coil length and heat transfer in Btu per sq ft of external coil area for 2 to 6 in. pipe coils using both atmospheric and open blast firing. These data, which were collected under carefully observed operating conditions, clearly indicate the advantage in using smaller coils where it is possible. With an atmospheric fired 2-in. tube, the hourly heat input per sq ft of coil was 6500 Btu. At the same liquid temperature and flue gas analysis, the burner heat input per sq ft of 4-in. coil had to be reduced to 4800 Btu to operate at the same flue gas temperature.

The 4-in. coil, which has an external area of 1.178 sq in. per lineal ft, could be replaced by two 2-in. coils having a total area of 1.244 sq in. Since the 4-in. coil

FIG. 1—Calculations required for determining size of immersion coil and burner input for heating a 3 x 3 x 8 ft tank.



The problem: Select coil size and burner capacity to heat 2½ in. water base solution in steel tank, not insulated, 3 x 3 x 8 ft, of ⅛ in. plate, to a temperatures of 150°F from 50°F. Load is 1200 lb of steel stock per hr, with 2 hr allowable heating up time. Burner to be of the open blast type. Flue gas temperature to be 500°F.

Calculations:

	Btu per hr
Heating up	
1. Liquid heating: 48 cf × 62.5 = 3000 lb $\frac{3000 \times (150°F - 50°F)}{2\ hr} =$	150,000
2. Liquid radiation and evaporation loss 24 sq ft × 1040 Btu per sq ft (from table IV) =	24,960
3. Tank radiation loss 90 sq ft × 180 Btu/sq ft =	16,200
4. Steel tank 90 sq ft × 5 lb × 0.12* × 100°F =	5,400
Total heat requirements	197,160

Coil and Burner Selection:

From table —100 to 200°F temp range—Blast Burners

Enter table with heat requirements (200,160 Btu) and given 500°F flue temp.

1. Coil size = 1 coil, 4 in. diam × 17½ ft long.
2. Burner capacity = 250,000 Btu per hr.
   (One 1¼ in. flame retaining nozzle at 8 in. W.C. has capacity of 250,000 Btu per hr.)

Operating Heat Requirements:

	Btu per hr
1. Liquid—radiation and evaporation loss (Table IV)	24,960
2. Tank radiation loss (Table IV)	16,200
3. Load—1200 lb × 0.12* × 100°F =	14,400
Total Btu	55,160

*Specific heat, steel.

TABLE II

Immersion Coil Selection Table—Atmosphere Burners (Stack Height 4 ft)
Liquid Temperature Range 100° to 200° F

Heat Required for Liquid, Radiation and Work Btu per hr	300°-400°F Flue Temp.			400°-600°F Flue Temp.			600°-800°F Flue Temp.			800°-1000°F Flue Temp.		
	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr
	Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft	
10,000	2	4	11,200	2	3	12,000	2	2½	14,000	2	2	14,000
15,000	2	6½	18,200	2	5	20,000	2	3½	20,000	2	3	21,000
20,000	3	6	23,500	2	6	24,000	2	4½	26,000	3	3	29,000
25,000	3	7½	29,400	3	6½	32,500	3	5	36,000	3	4	38,000
30,000	3	9	35,000	3	7½	37,600	3	5½	40,000	3	4½	43,000
40,000	3	12	47,000	3	10	50,000	3	7	51,000	3	6	57,000
	4	9					4	6				
50,000	4	11	59,000	3	12	63,000	4	8	68,000	3	7½	71,000
				4	10					4	6½	
60,000	4	13½	71,000	4	12	75,000	4	9½	80,000	4	8	86,000
70,000	4	15½	83,000	4	14	88,000	4	11	93,000	4	9½	100,000
	6	14								6	8½	
80,000	6	15½	93,000	4	16	100,000	6	11	107,000	6	9½	114,000
				6	14							
90,000	6	17½	106,000	6	16	113,000	6	12	120,000	6	11	132,000
100,000	6	20	120,000	6	17½	125,000	6	13½	133,000	6	12	143,000
120,000	.....	.....	.....	.....	.....	.....	6	16	160,000	6	14	168,000

Liquid Temperature Range 200°-400° F

Heat Required for Liquid, Radiation and Work Btu per hr	400°-600°F Flue Temp.			600°-800°F Flue Temp.			800°-1000°F Flue Temp.		
	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr
	Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft	
10,000	2	4½	12,500	2	3½	14,000	2	3	14,000
15,000	2	6	17,000	2	5	20,000	2	4	22,000
20,000	3	6½	25,000	2	6	26,000	3	4	29,000
25,000	3	8	31,000	3	6½	33,000	3	5	36,000
30,000	3	10	39,000	3	8	40,000	3	6	43,000
40,000	3	13	50,000	3	11	55,000	3	8	57,000
50,000	4	12	63,000	4	10½	67,000	4	8½	72,000
60,000	4	14	75,000	4	12½	80,000	4	10	86,000
70,000	4	16½	88,000	4	15	93,000	4	12	100,000
80,000	6	16½	100,000	6	13½	107,000	6	11	115,000
90,000	6	18	114,000	6	15	120,000	6	12½	130,000
100,000	6	21	125,000	6	16½	133,000	6	14	145,000
120,000	.....	.....	.....	6	20	160,000	6	16½	171,000

Liquid Temperature Range 400° to 600° F

Heat Required for Liquid, Radiation and Work Btu per hr	600°-800°F Flue Temp.			800°-1000°F Flue Temp.			1000°-1200°F Flue Temp.		
	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr
	Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft	
10,000	2	5	14,000	2	4	16,000	2	3	17,000
15,000	3	5½	21,000	2	5½	22,000	2	4	23,000
20,000	3	7	27,000	3	6	30,000	3	4½	32,000
25,000	3	9	35,000	3	7	36,000	3	5½	40,000
30,000	3	10½	41,000	3	8½	43,000	3	6½	47,000
40,000	4	10	53,000	3	11½	57,000	3	8½	62,000
50,000	4	13	69,000	4	11½	72,000	4	9	77,000
60,000	4	15	80,000	4	13½	86,000	4	11	93,000
70,000	6	15½	93,000	4	16	100,000	6	10	105,000
80,000	6	17½	105,000	6	14½	115,000	6	12	123,000
90,000	6	20	120,000	6	16	130,000	6	13½	139,000
100,000	.....	.....	.....	6	18	143,000	6	15	154,000

* Includes elbows — 1 elbow = 1.1 ft of pipe.

TABLE III

Immersion Coil Selection Table—Open Blast Burners

(Stack Height 4 ft)

Liquid Temperature Range 100° to 200° F

Heat Required for Liquid, Radiation and Work Btu per hr	400°-600°F Flue Temp.			600°-800°F Flue Temp.			800°-1000°F Flue Temp.		
	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr
	Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft	
20,000	2	3	25,000	2	2½	27,000	2	2	30,000
30,000	2	5	37,000	2	4	44,000	2	3	45,000
40,000	2	6½	50,000	2	5	54,000	2	4	60,000
50,000	2	8½	63,000	2	6	67,000	2	5	75,000
60,000	2	10	75,000	2	7½	83,000	2	6	90,000
70,000	2	11½	88,000	2	8½	93,000	2	6½	100,000
							3	5	
80,000	3	9	100,000	2	10	110,000	2	7½	115,000
				3	7½		3	5½	
90,000	3	10	113,000	3	8	120,000	3	6	127,000
100,000	3	11	125,000	3	9	135,000	3	7	145,000
120,000	3	13½	150,000	3	11	165,000	3	8	170,000
140,000	3	16	175,000	3	12½	187,000	3	9½	200,000
	4	12		4	10		4	7½	
160,000	3	18	200,000	3	14	210,000	3	11	230,000
	4	14		4	11		4	9	
180,000	4	16	225,000	4	12½	240,000	4	10	257,000
200,000	4	17½	250,000	4	14	267,000	4	11	268,000
	6	15½		6	11½				
220,000	4	19½	275,000	4	15½	294,000	4	12	314,000
	6	17		6	13		6	10	
240,000	4	21	300,000	4	17	320,000	6	11	343,000
	6	18		6	14				
260,000	6	20	325,000	6	15	346,000	6	12	372,000
280,000	6	22	350,000	6	16½	380,000	6	13	400,000
300,000	6	23½	375,000	6	17½	400,000	6	14	430,000
320,000	6	25	400,000	6	18½	427,000	6	15	465,000

Liquid Temperature Range 200° to 400° F

Heat Required for Liquid, Radiation and Work Btu per hr	400°-600°F Flue Temp.			600°-800°F Flue Temp.			800°-1000°F Flue Temp.		
	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr
	Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft	
20,000	2	4	24,000	2	3½	28,000	2	3	33,000
30,000	2	6	36,000	2	5½	44,000	2	4½	49,000
40,000	2	8	48,000	2	7	56,000	2	5½	60,000
50,000	2	10	60,000	2	8½	68,000	2	7	77,000
60,000	2	12½	75,000	2	10	80,000	2	8	90,000
70,000	3	12	90,000	2	11½	93,000	2	9	100,000
80,000	3	13½	100,000	3	10	110,000	2	10½	115,000
							3	7½	
90,000	3	15	113,000	3	11	120,000	3	8½	127,000
100,000	3	17	127,000	3	12½	137,000	3	9½	143,000
120,000	4	17½	150,000	3	15	165,000	3	11½	173,000
140,000	4	20	170,000	3	17	187,000	3	13½	200,000
				4	13½		4	10½	
160,000	4	24	205,000	4	15	210,000	4	12½	233,000
180,000	6	22½	225,000	4	17	240,000	4	13½	257,000
200,000	6	25	250,000	4	19	270,000	4	15	286,000
				6	17				
220,000	.....	.....	.....	4	21	294,000	4	16½	314,000
				6	18½		6	13½	
240,000	.....	.....	.....	6	20	320,000	6	15	343,000
260,000	.....	.....	.....	6	22	350,000	6	16	372,000
280,000	.....	.....	.....	6	24	380,000	6	17½	400,000
300,000	.....	.....	.....	.....	.....	.....	6	18½	425,000

* Includes elbows — 1 elbow = 1.1 ft of pipe.

TABLE III—Continued

Liquid Temperature Range 400° to 600° F

Heat Required for Liquid, Radiation and Work Btu per hr	600°-800°F Flue Temp.			800°-1000°F Flue Temp.			1000°-1200°F Flue Temp.		
	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr	Pipe Coil		Gas Input, Btu per hr
	Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft		Dia., in.	Lgth.,* ft	
20,000	2	4½	27,000	2	3½	28,000	2	3	33,000
30,000	2	6½	40,000	2	5½	44,000	2	4½	49,000
40,000	2	8½	51,000	2	7	56,000	2	5½	60,000
50,000	2	11	67,000	2	9	72,000	2	7	77,000
60,000	2	13½	80,000	2	11	88,000	2	8½	93,000
	3	10½							
70,000	3	12½	93,000	2	12½	100,000	2	10	110,000
							3	7½	
80,000	3	14	105,000	3	10½	114,000	3	8½	128,000
90,000	3	16	120,000	3	12	132,000	3	9½	142,000
100,000	3	18	135,000	3	13	143,000	3	10½	157,000
	4	16							
120,000	4	19	160,000	3	15½	171,000	3	12	180,000
140,000	4	22	187,000	3	18	200,000	3	14½	216,000
	6	19		4	14		4	11½	
160,000	6	21½	214,000	4	16½	230,000	4	13	246,000
180,000	6	24	240,000	4	18	252,000	4	14½	277,000
200,000	6	27	267,000	4	20	280,000	4	16½	312,000
				6	17½		6	13½	
220,000	.....	.....	.....	6	20	320,000	6	15	345,000
240,000	.....	.....	.....	6	22	350,000	6	16	370,000
260,000	.....	.....	.....	6	23	370,000	6	17½	400,000
280,000	.....	.....	.....	6	25	400,000	6	18½	425,000

* Includes elbows — 1 elbow = 1.1 ft of pipe.

TABLE IV

Heat Losses From Tanks

Liquid Temperature, °F	Heat Loss From Liquid Surface Btu per sq ft per hr			Heat Loss Through Tank Walls Btu per sq ft per hr			
	Evaporation Loss*	Radiation Loss	Total Surface Heat Loss	Bare Steel Walls	1 in. Insulation	2 in. Insulation	3 in. Insulation
90	80	50	130	50	12	6	4
100	160	70	230	70	15	8	6
110	240	90	330	90	19	10	7
120	360	110	470	110	23	12	9
130	480	135	615	135	27	14	10
140	660	160	820	160	31	16	12
150	860	180	1040	180	34	18	13
160	1100	210	1310	210	38	21	15
170	1380	235	1615	235	42	23	16
180	1740	260	2000	260	46	25	17
190	2160	290	2450	290	50	27	19
200	2680	320	3000	320	53	29	20
210	3240	360	3590	360	57	31	22
225	.....	420	420	420	62	35	23
250	.....	510	510	510	70	40	25
275	.....	600	600	600	81	45	29
300	.....	705	705	705	92	51	33
325	.....	850	850	850	103	57	36
350	.....	990	990	990	114	63	40
400	.....	1335	1335	1335	138	75	49
450	.....	1705	1705	1705	162	88	58
500	.....	2115	2115	2115	178	101	68
550	.....	2570	2570	2570	204	115	78
600	.....	3080	3080	3080	232	129	89

* Water only.

has an internal cross sectional area of 12.73 sq in. and the combined cross sectional area of the two 2-in. coils is 6.72 sq in., it follows that the rate of flow of combustion gases is almost twice as great through the 2-in. coils as it is through the 4-in. size. The higher velocity is accompanied by greater turbulence and scrubbing action and consequently a higher rate of heat transfer through the walls of the coil.

When blast burner equipment is employed, the advantage of using the smaller tube sizes is reduced because of the higher velocity and turbulence which normally accompany this type of firing. There is still sufficient advantage, however, in the small tubes to recommend their use wherever possible.

As shown in this same table, the use of blast burners is to be preferred to atmospheric burners for coil firing even with the additional equipment cost involved. Smaller and shorter coils can be utilized with no greater flue losses. Combustion can be more readily controlled and stack conditions have very little effect on performance or capacity.

There is no attempt in this article to cover the use of sealed-in blast burners or atmospheric burner-coil systems using an outlet suction device. Burners of these types have been very satisfactorily applied to immersion tube heating and give maximum capacities which are slightly higher than the open blast type which may be limited by flame flare-out if excess capacities are desired or if extremely long tube lengths are used. Operating efficiencies of all three types of equipment will be comparable at the same heat input rates.

As previously stated, it is the object of this paper to attempt to clarify the engineering of the immersion heating equipment by presenting a simplified selection method in tabular form. These tables give the coil diameter and length and the burner heat input once the net heat requirements and the desired flue temperature are known.

Data collected from a variety of sources were first compiled into a series of curves, showing the coil pipe size and length for the burner heat input. The proper coil size could readily be selected from this chart but it was first necessary to calculate the burner input from the net heat requirement by assuming the flue loss. Also, these basic curves would require separate tables for each flue temperature. Hence, in order to eliminate some of the complications of this method, these data were refigured and set up in tabular form. These tables are arranged so that the coil size, length and burner capacity can be read directly if the net heat requirement and the desired flue gas temperature are known. Tables II and III have been prepared to cover the heating of materials up to 600°F with coil sizes ranging from 2-in. to 6-in pipe. Flue temperatures from 200°F up to as high as 800°F above the liquid temperature give a selection of flue losses varying from 15 to 35 pct.

These selection tables have been prepared by averaging available information on the design, performance and application of immersion coils under varying installation conditions. To provide a reference point it was necessary to establish a set of conditions so that all data could be converted to a uniform base. Excess air was held to approximately 20 pct and stack height held to 48 in. above the burner line in order to establish maximum input rates and coil lengths, particularly with the atmospheric fired units. The recent AGA immersion heating research report, in discussing the effect of flue height cites a 4-in. coil with a 20-in. high stack having a heat input of 30,000 Btu per hr. It was found possible to increase this input to 80,000 Btu per hr by raising the stack height to 70 in. Increases such as this may be possible where the original stack is only slightly above the burner line, but other experimental data seem to indicate that increases of between 5 and 10 pct may be added to either the Btu input or the coil length of atmospheric burner installations per foot of additional stack height.

Maximum burner inputs with a standard flue height are limited by two factors; the cross sectional area of the tube and the tube length. Small tube diameter or excess length will cause either flame flare-out at the coil inlet or incomplete combustion due to lack of secondary air.

A reasonably accurate calculation of the net heat required by the immersion heated installation is necessary for the satisfactory application of these tables. This calculation is based on knowing a few basic and readily available facts about the operation. These include the tank, its size, material and whether or not it is insulated, plus the operating temperature and specific heat of the liquid to be heated. These data are used to figure the total evaporation and radiation heat losses, as well as part of the operating heat requirement. Other information, such as the weight of work per hour, the time allowed to bring the liquid to temperature, the type of burner equipment to be used, and the desired flue gas temperature should be available before starting the calculation.

Fig. 1 illustrates in detail the steps involved in calculating the various heat losses and requirements, as well as the selection of the proper coil size and burner capacity. It is first necessary to obtain data on the seven items listed in the table. This information can then be used to figure all heat requirements.

The heating up calculations may be divided into four steps, as shown in the example:

(1) Heat for raising the liquid from its original temperature up to operating temperature in the time selected. In this case the specific heat of water (1.0) is not indicated in the calculation. If other materials are used, this figure may be obtained from standard tables.

(2) Radiation and evaporation losses from the exposed surface of the liquid can be easily figured by referring to table IV.

(3) Radiation losses from the tank walls can also be found in table IV.

(4) Heating the tank material to operating temperature is calculated by using the specific heat of steel (0.12) multiplied by the weight and the temperature rise.

The operating heat requirements may be obtained by using the liquid radiation and evaporation losses and the tank radiation losses plus the heat necessary for the hourly work load. In the example, both the total heating up requirements and the total operating requirements have been calculated and the largest picked for use in selecting the coil and burner. It is recommended that this double procedure be followed as under conditions of heavy production the operating requirements may be in excess of the heating up figure. Normally, unless an extended heat up period

is allowed, the total heating up figure can be used.

The next step is to refer the total net heat requirement figure, in this case 200,000 Btu per hr, to the proper table. With blast burner equipment and an operating temperature of 150°F we would use table III. At 200,000 Btu input and under the 400°-600°F flue temperature column, we find that a 4-in. coil 17½ ft long is indicated with a burner capacity of 250,000 Btu per hr. The efficiency of the installation is $\frac{200,000}{250,000}$ or 80 pct. Table III also indicates that a 6-in. coil, 15½ ft. long, could be used, but as explained earlier in the paper, the smaller coil size should be used. However, if the coil length selected cannot be arranged to fit the tank, a compromise choice will have to be made. The data can be interpolated to make this selection.

It is possible to obtain higher combustion efficiencies or rather lower flue losses by reducing the gas input per unit of coil length. In general it is not desirable to go to heat transfer rates lower than those shown in the tables because of the excess coil areas and lengths required and the possibilities of trouble from moisture condensation in stacks.

The design and selection data contained in the attached tables have been employed in applying immersion coil heating equipment to numerous solution and oil heating tanks. If these specifications are followed, satisfactory operation of the heating equipment may be practically guaranteed.

German High Temperature Turbine Blade Steels

TWO steel alloys used by the Germans in making heat resistant gas turbine blades for jet planes are described in a report prepared by Alexander Field, an investigator for the Technical and Industrial Intelligence Branch, Dept. of Commerce, from microfilm records of data sheets impounded at the Krupp plant in Essen.

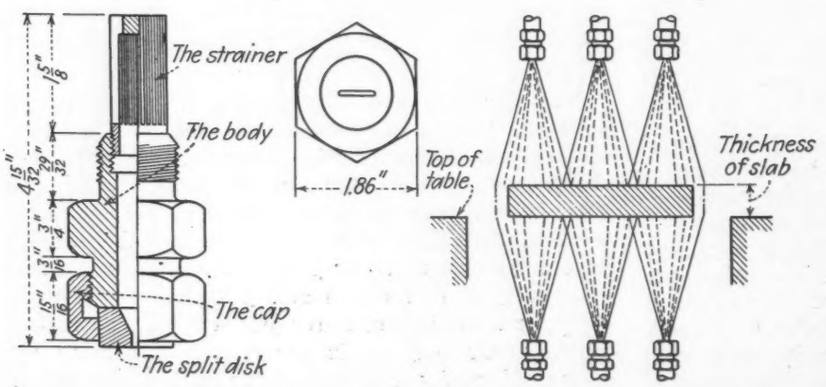
One alloy, known as "Tinidur," was composed of 0.15 pct C (max), approximately 30 pct Ni, 15 pct Cr and 1.8 pct Ti. Because of the German nickel shortage, Tinidur was later replaced by "Chromadur." This alloy was composed of a max of 0.15 pct C, approximately 18 pct Mn, 12.5 pct Cr, 1.0 pct Va and 0.25 pct Ni. The two alloys were made in 4-ton induction furnaces and cast in molds 32 to 38 cm (12.6 to 15 in.) square. They were forged by means of rapid blows with a 6000-lb hammer.

All sheet metal used in high temperature service in the jet planes was low carbon steel with about 0.5 pct Ti. The sheets were case-hardened for oxidation resistance up to 900°F, either by chromizing or aluminizing. The depth of the case was 0.1 mm (0.00394 in.). The working temperature of the jet plane combustion chamber was said to be 600 to 700°F.

High-Pressure Water Jets for Descaling

A NEW type nozzle for use in descaling with high-pressure water jets is described in *Iron and Coal Trades Review* (London), May 24, 1946. The report points out that a great deal of experimental work has been carried out in Britain in arriving at a form of nozzle capable of giving a jet with the desired cutting action while being economical in the use of water. It has been found that an impinging force developed by a thin, sharp jet of high-pressure water gives much better results than a jet of equal force having a larger impinging area and produced by a larger volume of water at a lower pressure. Furthermore, the smaller quantity of high-pressure water correspondingly reduces cooling of the material, an important factor in continuous rolling.

It is on the foregoing principles that the Harland-Aldrich spray nozzle shown in the accompanying illustration, has been developed. In its present form this nozzle provides an impinging force equal to 95 pct of the potential energy supplied to the orifice. This nozzle is the outcome of extensive research and experience in the manufacture and application of complete descaling systems to the steel industries, first in the United States and later in this country. The design employs a body and hardened stainless-steel split disk with a rectangular outlet which efficiently converts pressure into velocity to produce a uniform jet of knife-edge shape. Special attention is paid to the accurate finishing of each disk to correct contour, performance being tested under high pressure in the factory. From experience it has been found that the necessary impinging force varies from 5 to 10 lb per lineal in. of slab-width according to the degree of descaling required. A value of 7½ lb per in. is a good average and this in practice requires 4.1 gal per min at 900 lb per sq in. and 2.7 gal at 2000 lbs pressures per in. of slab-width using appropriate nozzles.



How to Weld Aluminum

Modern seam and flash welding methods, soldering and brazing by the furnace, dip and torch methods are described in this, the fourth and concluding part of a four-part article. Cleaning before and after brazing and final inspection of joints are also covered.

o o o

SEAM welding is very similar to spot welding except that the spot welding electrodes are replaced by roller electrodes—wheels some 6 to 9 in. in diameter. The equipment used in seam welding is quite similar to conventional ac spot welding equipment. For this type of work, however, the welder must be fitted with electronically controlled timing equipment which will initiate and cut off the current in synchronism with the supply of voltage, and do this with sufficient accuracy to produce uniform welds.

The roller electrodes used in seam welding are usually copper alloy dies from 3/8 to 5/8-in. thick. In order to concentrate the current in the weld, one or both of the electrodes are dressed to a vee of a 158° to 166° included angle or to a 2 to 3 in. radius. The electrodes are cooled by a constant flow of water directly onto the electrode near the weld.

This is the concluding article of a series of four prepared by the engineering staff of Reynolds Metals Co. The first three appeared in the issues of June 20, and 27, and July 4. These dealt respectively with gas, arc, and spot welding.

Welding may be accomplished by rolling the electrodes over the material at a constant rate of speed. This speed usually varies between 1 to 5 fpm, the greatest speed naturally being for the thinnest materials. If indexing mechanism is used the current flows during the instant the wheel is motionless. A highest quality weld is produced by this method.

Seam welding methods make it possible to produce a series of uniformly spaced spot welds. Further, the spots can be overlapped, producing a continuous seam or pressure-tight weld. The spacing of the welds (the number of spots per in. of seam) may be determined by adjustment of the timing equipment and of the speed of travel of the roller electrodes. Welding current and electrode pressure are adjusted to produce the desired surface condition and the proper weld width which should be about twice the thickness of the material being welded plus 1/16 in.

Seam welding operations are also troubled with aluminum pickups. Excessive welding speeds, for example, will often result in the work sticking to the electrode. The aluminum which adheres to the electrodes may be removed by dressing the roller with a suitable grade of abrasive cloth. A coarse grade of abrasive is generally recommended in order to produce a rough surface that will prevent slippage between the work and the electrodes. It is usually necessary to dress roller electrodes after every three to five revolutions when continuous seam welding is being performed, and every 10 to 20 revolutions on intermittent welding. Roller electrodes may be continuously dressed by holding a medium fine grade of commutator stone against the wheel with 5 to 10 lb of pressure.

Flash Welding

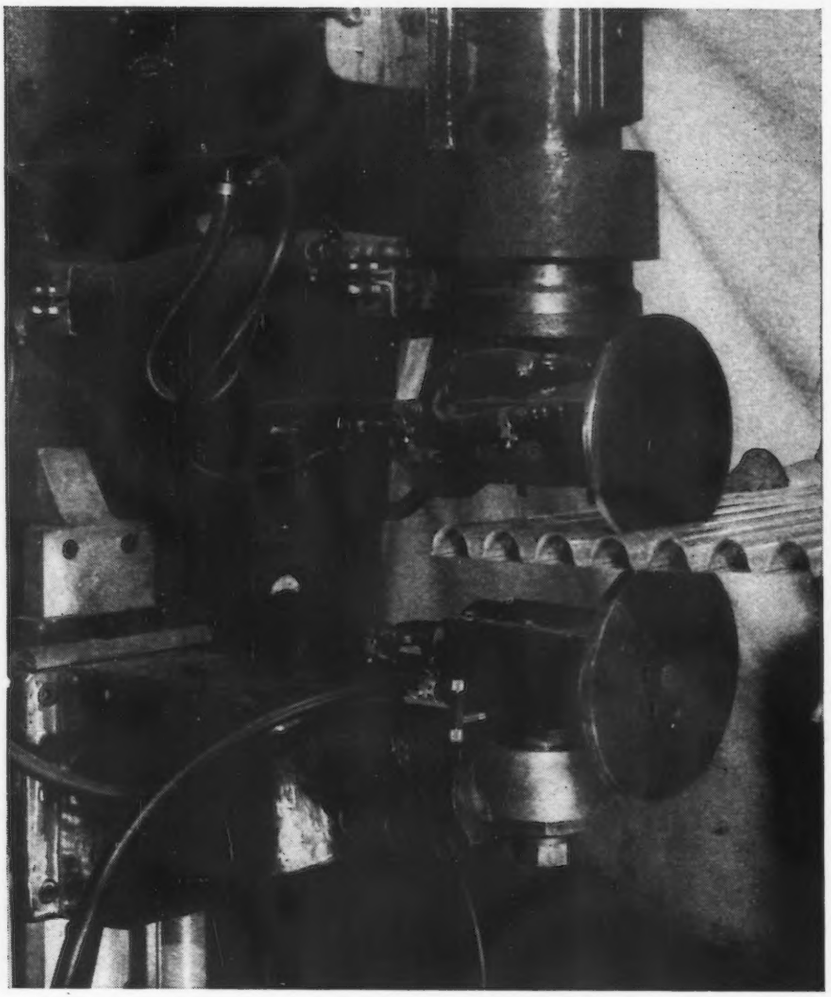
The third resistance welding process used to join aluminum alloys is flash welding. This process is accomplished by securely clamping the two parts to be welded in the jaws of a flash welding machine, and moving the ends of the two pieces towards each other until an arc is established. Movement is continued to maintain the arc until the ends have been sufficiently heated, when the weld is made by driving the two pieces together with sufficient pressure to hold them in contact until cool.

Flash welding is used to butt and mitre weld sheets, bars, tubing and extrusions. Mitre joints may be made at any angle between 60 and 180°. Flash welding is purely a production welding process since the cost of its dies plus the time and material involved in setting up the welder would make it too costly to use unless a large number of similar welds are to be made. Production may be quite high and depends largely on the rapidity with which the welder can be loaded and unloaded, inasmuch as the welding time is extremely short, approximately 2 to 3 sec.

The time during which welding current flows is extremely critical. For this reason, the equipment manufacturer's recommendations regarding time and current should be followed carefully.

Aluminum flash welders require a much larger transformer capacity than do flash welders for steel. For satisfactory results, the aluminum welder must be capable of supplying a current density of 100,000 amp per sq in., when the parts are held in firm contact, without arcing. The secondary voltage is about the same as that for steel, 2 to 20 v. Upset pressures must also be on the high side, since it is estimated that 20,000 to 30,000 psi should be used.

The parts to be welded are clamped by hard-drawn copper or copper alloy dies which have been accurately



o o o

FIG. 14—Seam welding makes possible a series of uniformly spaced spot welds by the use of rotary electrodes, greatly speeding up production on long joints.

o o o

shaped to fit each part. In addition to holding the parts securely, the dies serve to conduct the weld current into the aluminum and to conduct heat away from the parts during welds. The die clamping pressure must be sufficient to prevent slippage and yet be spread over sufficient area to avoid crushing.

Proper initial and final die spacing is important if satisfactory welds are to be obtained. Initial die spacing is varied according to the thickness of the material to be welded. On thin tubing or sheet stock about ½ in. will prove satisfactory. As thickness is increased, the spacing is increased; in welding ¾ in. bar stock the dies are spaced approximately 1 in. apart.

Final spacing is usually 1/16 to ⅛ in., depending upon the thickness and the amount of material upset. Too close final spacing, especially if the dies hit, causes excessive die wear and increases the likelihood of machine damage. On the other hand, if the final spacing is too great, the resulting weld is likely to be unsound because of the low upset pressure and misalignment.

Flash welding permits welds to be made between dissimilar aluminum alloys or between aluminum alloys and other materials. In most cases, the joints produced are of equal, if not greater, strength than that obtained by fusion welding processes.

Aluminum Brazing

Aluminum alloys joined by brazing will have neater, more economical joints than can be obtained by fusion welding. Brazed joints likewise require less finishing than torch welded joints but are substantially equal to them so far as strength or corrosion resisting qualities are concerned. An added advantage is the fact that brazing is ideally suited to quantity production.

In brazing aluminum as in brazing other metals, the brazing alloys used have a lower melting point than the parent metal. The brazing temperature need be sufficient only to melt the brazing alloy, not the parts being joined. Since the filler material is an aluminum alloy, the finished joint will have the characteristics of a welded rather than a soldered joint.

The natural oxide coating of aluminum alloys makes it necessary to use a flux which will melt below the brazing temperature, and to prepare the surfaces so that the filler material can flow into the joint. The flux, a finely ground powder, may be applied to the joint dry, or mixed with water or methyl alcohol. While the method of application depends on the type and number of parts in production, either painting or spraying a flux mixture will prove most economical.

Aluminum may be brazed by three methods—furnace, dip and torch. While similar alloying materials are used, each method differs from the others in the manner in which it is applied. Furnace brazing is probably the most important method. The parts to be joined are assembled, fluxed, and then heated to the proper temperature in a furnace. This procedure is similar to that used in the brazing of steel or copper, but the flux, temperature, and time involved are naturally much different.

Dip brazing, as the name implies, is done by dipping the assembly that is to be brazed into a molten flux bath. This bath is held at a temperature slightly above the melting point of the brazing alloy but below the melting point of the base metal, thus permitting the filler material to flow into the joint. In this method, the parts are supported by jigs.

Torch brazing is similar to torch welding except that the special filler metal and brazing flux permit the operation to be carried on with little or no melting of the base metal.

Aluminum brazing methods have been developed for a number of representative aluminum alloys covering

a wide range of mechanical properties. The most popular of the alloys which produce consistently good results are the wrought non-heat treatable alloys such as 2S and 3S. In the heat treatable alloys, brazing is confined to R353 and R361. The strength of brazed joints for any of the above alloys is about the same as that of torch welded joints. It should be remembered that the brazing is above the annealing temperature. Consequently, furnace or dip brazed parts will return to the annealed condition regardless of their original temper.

Good strength in heat treatable alloys may be secured in some assemblies if the parts are rapidly quenched after brazing, otherwise the properties of furnace or dip brazed heat treatable alloys will approach those of annealed metal. When maximum strength is essential, the parts should be re-heat treated after assembly.

The flow of the brazing alloy in aluminum brazing is accomplished by capillary attraction, which is in some instances aided and in others hindered by gravity. Since the molten brazing alloys must flow into the joint, the proper placement of the brazing alloy prior to heating is of the utmost importance. Proper clearance is also quite important and press fits are out of the question. For short lap joints, less than ¼ in., clearances of 0.006 to 0.010 in. will usually produce a satisfactory joint. On longer joints, those over ¼ in. in length, clearances should be from 0.010 to 0.025 in.

The main requirement for a good brazing filler alloy is sufficiently low melting temperatures to provide a practicable range at which brazing can be done. By alloying pure aluminum with silicon, copper, zinc and other elements, it is possible to obtain a brazing alloy with a melting point substantially below that of aluminum. The brazing alloy may be applied as a wire ring or as a sheet washer in the same manner as when brazing other metals.

The brazing alloy is sometimes applied as a clad surface. In this case, aluminum brazing sheet will consist of an aluminum core coated on one or both sides with a brazing alloy, which is bonded to the core.

The furnace brazing of aluminum alloys is similar to the same process as applied to other metals except that the temperature range is lower than for ferrous metals. Furnace brazing may be used to join all aluminum parts of thicknesses ranging from 0.006 to 0.5 in. All joints of a given part, however, should be nearly the same thickness.

Batch type electric furnaces have been used in most cases, although conveyor type or gas fired furnaces should prove satisfactory if designed to operate in the range mentioned. Practically all commercial furnace equipment has temperature control regulations to within 15°F, which degree of accuracy is needed for consistent results. If a gas fired furnace is used, however, it is absolutely essential that the products of combustion, flue gases, do not come in contact with the items being brazed.

Brazing furnaces should be provided with baffles so that radiant energy from the heating units will not cause local overheating in the load. In electric furnace operation, it is also important to keep drops of molten flux from falling on the heating units and causing deterioration of the coils. Circulation of air in the furnace, while not essential to brazing, is desirable in the maintenance of uniform temperature.

The furnace brazing operation causes no fumes or

o o o

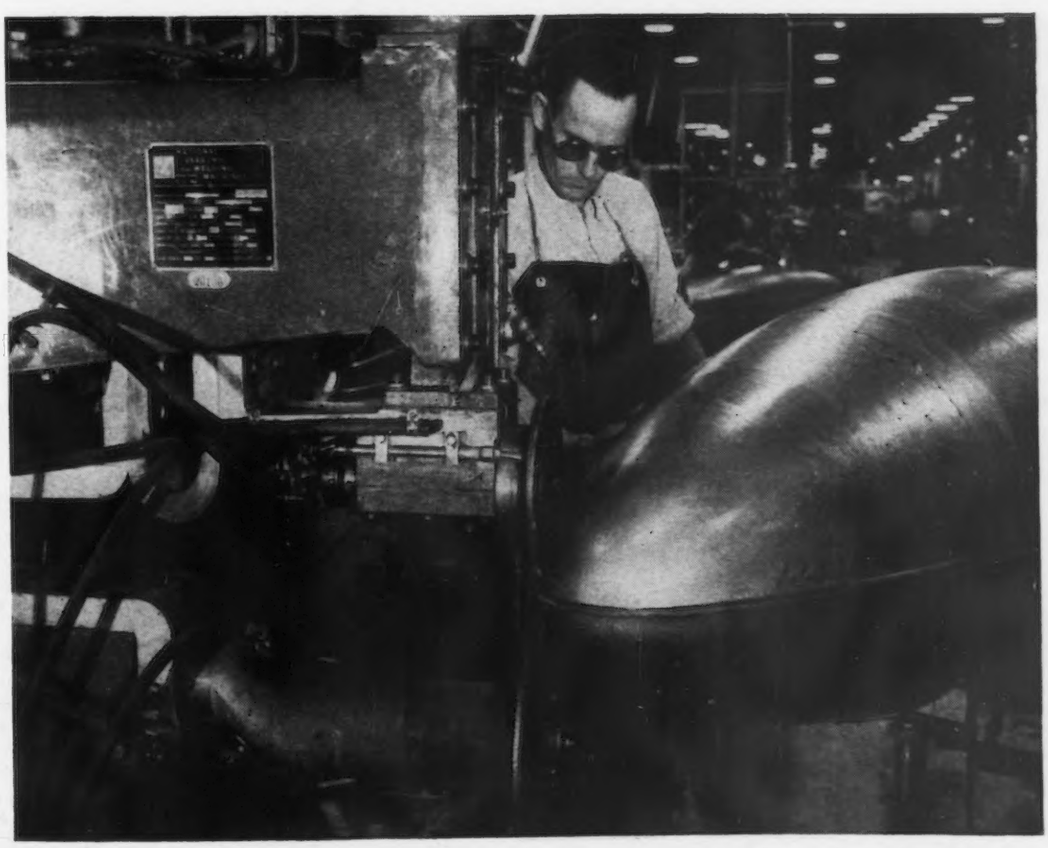


FIG. 15—By overlapping the spots, gas tight seams are readily made on the seam welder, as in the case of this aircraft fuel tank. Notice the cooling water flowing over the electrodes.

o o o

gases requiring ventilation to the outside air. A small amount of hydrogen may evolve when the fluxes have been mixed with water, and must be allowed to escape lest the gas ignite with sufficient violence to distort the parts when closed assemblies are brazed. The formation of hydrogen gas may be prevented by mixing the flux with methyl alcohol instead of water, or by drying the fluxed part by preheating it prior to placement in the brazing furnace.

Production brazing in an air atmosphere is apparently quite satisfactory, and experiments have shown no advantages for the commonly used controlled atmospheres. While experiments show good results in a pure hydrogen atmosphere, it has not yet been found necessary to use this gas.

The brazing time and temperature for a specific part will depend on the aluminum alloy being brazed, the brazing alloy used and also the thickness and shape of the part. The temperature will vary between 1050° and 1185°F. The exact value is determined in each case by trial.

The time in the furnace must equal the time required to reach the brazing temperature, plus a brazing period of from 3 to 8 min. The effect of thickness is shown by the fact that parts 0.008-in. thick have been brazed in 4 min, while parts 0.375-in. thick have required 45 min of furnace time.

Jigs and fixtures may be used to maintain alignment of parts if provision is made for the differences in their thermal expansion as compared with that of aluminum. Steel, stainless steel or graphite jigs should be so designed that their expansion will not distort the aluminum parts. Brass and copper are not used for jigs since they alloy readily with aluminum if contact is made in the presence of flux at brazing temperature.

The use of jigs increases the required heating time. For this reason, it is preferable to design parts which can be held in alignment in the assembly by the fit of the parts, by aluminum rivets, by beading or by clinching. Spot welding may be used to advantage, if the welding operation can precede fluxing. Tack welding with a torch is frequently used.

Pre and Post Brazing Cleaning

It is frequently desirable to clean the parts prior to brazing. The type of cleaning depends on the amount of dirt or forming lubricant present, but it is usually sufficient to use a solvent. If this is not adequate, however, an etching procedure, similar to that described below, may be used.

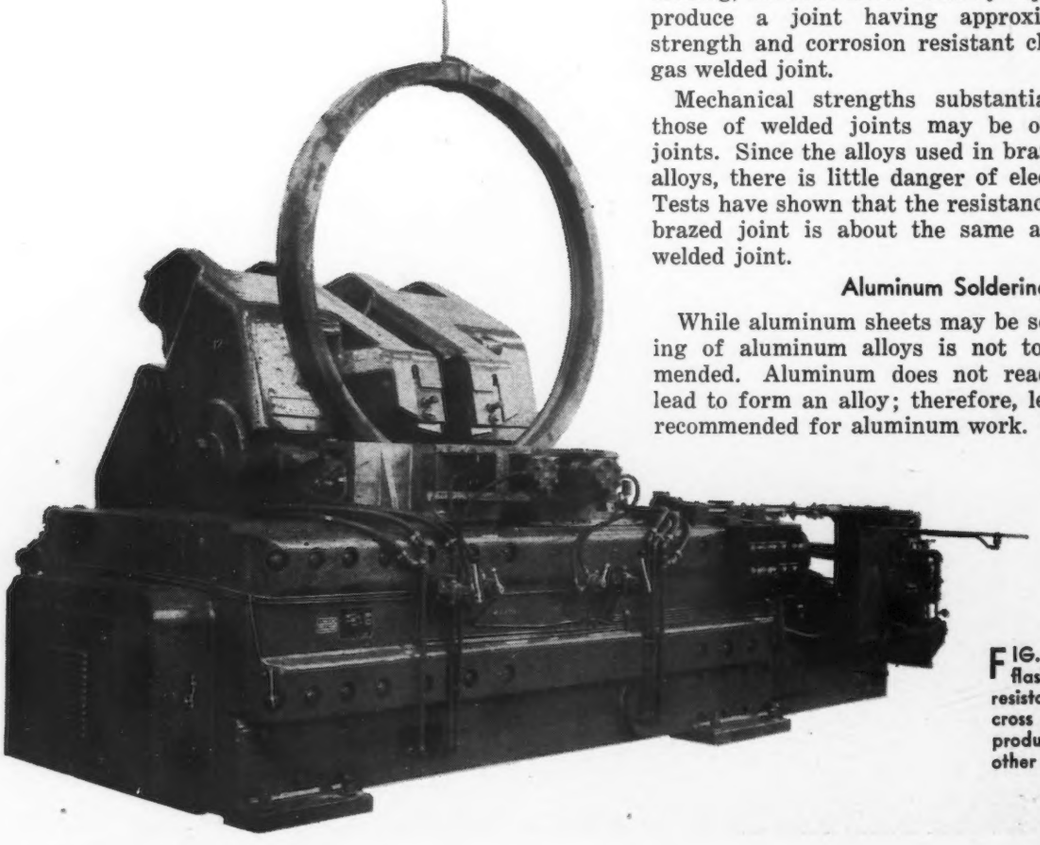
After brazing, the residual flux is removed in order to prevent corrosive attack and to improve the appearance of the part. While the flux dissolves in water, a more vigorous cleaning is usually advisable. One good method especially desirable for thick walled parts is to immerse the part in boiling water to remove most of the flux, then dip it for 45 to 60 sec in a 5 pct sodium hydroxide solution held at about 150°F. This is followed by a water rinse, by a 1 to 2 min dip in a cold 50 pct nitric acid solution, and by a final water rinse to remove the acid. If the parts that have been brazed are of thin walled construction, a less drastic cleaning procedure should be followed. With such articles, a dip in the cold nitric acid solution after the hot water soak should be satisfactory.

Any of the common welding gas combinations such as oxyhydrogen, oxyacetylene or oxyhydrocarbon fuels are also quite suitable for torch brazing applications. In this application, the brazing alloy is pre-placed, as in the case of furnace brazing, in the properly fluxed joint and is melted by the torch flame. As in furnace brazing, the filler metal flows by capillary attraction to produce a joint having approximately the same strength and corrosion resistant characteristics as a gas welded joint.

Mechanical strengths substantially equivalent to those of welded joints may be obtained in brazed joints. Since the alloys used in brazing are aluminum alloys, there is little danger of electrolytic corrosion. Tests have shown that the resistance to corrosion of a brazed joint is about the same as that of a torch welded joint.

Aluminum Soldering

While aluminum sheets may be soldered, the soldering of aluminum alloys is not too strongly recommended. Aluminum does not readily combine with lead to form an alloy; therefore, lead solders are not recommended for aluminum work. Tin-zinc-aluminum



o o o

FIG. 16 — Automatic flash butt welder for resistance welding large cross sections in the production of rings and other circular members.

o o o

solders are preferable, and should be applied with a nonoxidizing flame.

There are also a number of alloys and specially prepared fluxes for soldering aluminum, each of which requires special treatment to produce satisfactory results. The various manufacturers of these solders give definite instructions for their use with various aluminum alloys, and these directions should be followed carefully.

It must be borne in mind that most metals or combinations of metals used for aluminum soldering possess solution potentials different from those of aluminum alloys. An aluminum soldered joint may, therefore, be attacked by galvanic corrosion and disintegrate rapidly if exposed to moisture. For this reason, it is desirable that aluminum soldered joints which may be subjected to corrosive environments be protected against corrosion by paint or varnish or by means of galvanic protection.

Inspection of Aluminum Welding

The best way to insure satisfactory welds, particularly in the case of gas and arc welding, is to qualify the welding operator in accordance with one or more of several qualification tests such as those of the U. S. Army Air Force, U. S. Naval Aircraft Factory, U. S. Navy, or one of the qualification tests of various industrial organizations.

In arc and gas welding, it is common practice to qualify the welding operator in a manner similar to that used in steel welding, that is, by testing weld specimens by a guide bend, free bend, tensile or nick break test. These testing methods make it possible to determine the ductility, strength and soundness of the weld.

Welds are sometimes sectioned and etched for microscopic or macroscopic examinations. This method is most commonly used in inspection of spot welding.

All of the aforementioned methods of inspection are, of course, destructive to the weld. In applications where destructive testing is not desirable, the usual practice is to resort to visual inspection. The weld is carefully inspected, usually with the unaided eye, though sometimes with a magnifying glass, to determine the apparent soundness of the weld joint from its appearance. Other nondestructive test methods include the use of radiography and of fluorescent materials.

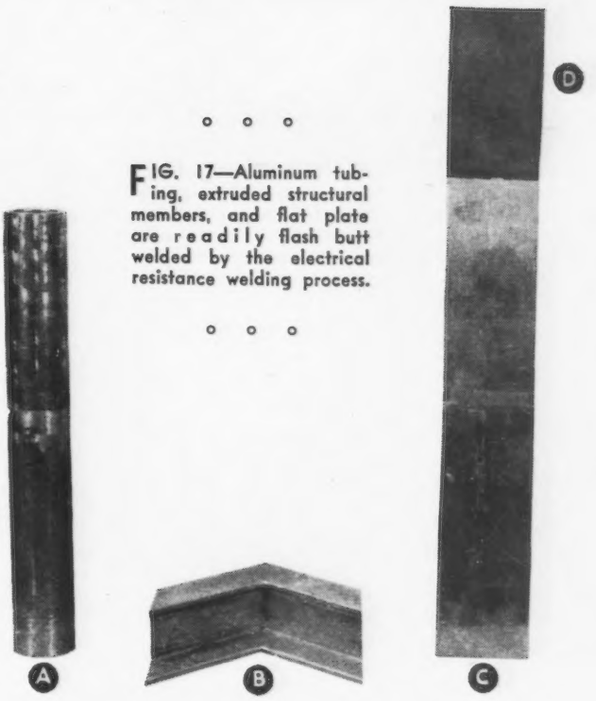


FIG. 17—Aluminum tubing, extruded structural members, and flat plate are readily flash butt welded by the electrical resistance welding process.

Radiography, primarily X ray, is used for the inspection of both fusion and resistance welds. It is particularly useful in the inspection of spot welds since the size of weld nuggets, the presence of cracks and porosity, and any undesirable properties such as welding splashes or flashouts may be readily determined.

In the fluorescent particle method of inspection, the weld seam is coated with an oil carrying a fluorescent material in suspension. After application of the coating, the fluorescent material is wiped away, and the seam is viewed under an ultraviolet light. Cracks or other surface defects will trap some of the fluorescent particles and so can be readily seen.

Additions Improve Cast Steels

EXCELLENT casting characteristics and high physical properties, which can be developed in both light and heavy sections, should make copper alloy steels of interest for postwar castings, according to a report, PB-13748, prepared by H. F. Taylor, H. F. Bishop, and R. C. Wayne, which deals with research on copper alloy steel castings at the U. S. Naval Research Laboratory.

Low alloy copper-bearing cast steels are said to be particularly useful for light weight castings, since the addition of copper increases the ratio of yield strength to tensile strength without materially affecting ductility. If manganese and silicon are added in above normal amounts, even better properties are obtained.

Other advantages pointed out in the report include: (1) Alloy steels containing more than 0.6 pct Cu may be precipitation hardened without liquid quenching to increase yield and tensile strength still further. These steels have low impact resistance, but good elongation and reduction of area. Sections as large as 8 in. can be hardened throughout by a precipitation strengthening draw after normalizing. (2) Copper alloy cast steels containing not more than 0.20 pct C show good weldability. If they contain about 0.10 pct C and have a yield strength above 50,000 psi, they are readily weldable without preheating or postheating treating. (3) A combination of copper and 1 pct (or more) Si results in ecellent fluidity and prevents the steel from becoming brittle at subzero temperatures. (4) Copper alloy steels are more resistant to scaling during heat treatment than are plain carbon or molybdenum steels.

Soft Water Rinse

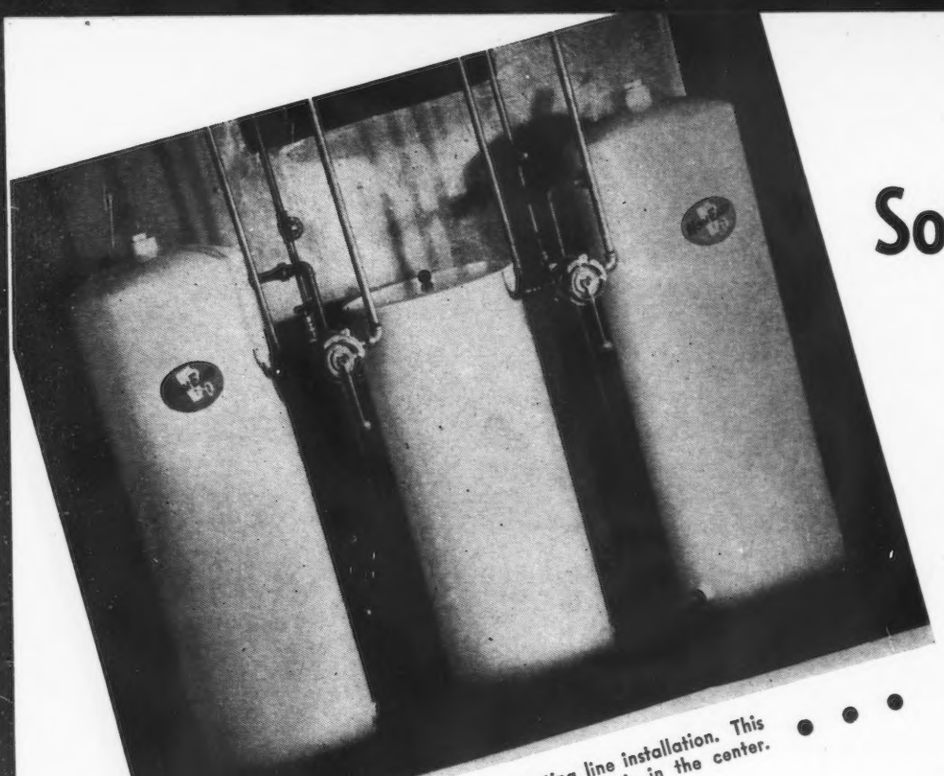


FIG. 1—Typical water softening unit for plating line installation. This unit has semiautomatic controls. The brine tank is in the center.

WITH the end of the war the trend toward decorative finishes has been revived and bright nickel and decorative chrome baths are again available. Aluminum has also entered this competitive field and because of its excellent corrosion resistance, lightness and ease of buffing it is natural that aluminum should prove very popular. The trend to date for decorative aluminum finishes has been in dyed oxide coatings. Attractive pastel colors have been developed for dyeing highly polished aluminum surfaces. However, in order to obtain a metallic like finish, other than that obtained by the natural Alumilite process[1] it has been necessary to resort to plating. The techniques for plating aluminum have been developed to the state now where aluminum can be plated with the ease of steel, provided more than ordinary care is used in preparing the aluminum prior to electroplating. However, it has been the experience of the writer that many important steps are usually omitted between laboratory practice and actual production operation. For example, a large pocketbook manufacturing plant which had been using polished brass parts gold plated, came to us with the question, "can aluminum be gold plated and produce a finish comparable to what the manufacturer had been receiving on brass?" While Bogue Electric Co. had done extensive laboratory work with the zincate method of plating on aluminum as outlined by the Aluminum Co. of America, it had been in the direction of obtaining maximum adhesion. Since this work was not with highly polished surfaces the aluminum could therefore be etched with strong caustic soda. When a silicate inhibited aluminum cleaner was substituted, the adhesion was greatly reduced and on many parts blistering of the plate developed. Changing to a chromate inhibited cleaner and substituting a hot water rinse for the cold rinses greatly reduced these rejects. We were still at a loss to discover why, for some unknown reason, some parts would blister and others treated in the same baths would show excellent coatings.

Spectrographic analysis of the aluminum being treated showed no difference between the good and poor adhering parts. However, when a part which showed blistering was stripped, in dilute nitric acid, rinsed, and then immersed in the zincate bath excellent adhesion would be obtained. This provided a clue. Aluminum cleaners contain soap and rinsing the parts in water did not always remove the calcium and magnesium soap film which prevented the zincate bath from depositing uniformly adherent coatings of zinc. The dip in strong nitiric acid will, in most cases, destroy this film. An analysis of the water showed it to contain 150 ppm calcium carbonate, the equivalent of 9 grain hardness water. A Belcolite type water softening unit, manufactured by the Bogue Electric Co., was designed and placed into service. A typical duplex water softening system, with semiautomatic controls, is shown in fig. 1. Fig. 2 shows the piping arrangement for such an installation. After this installation was made, the rinse contained water of zero hardness. Favorable results were obtained and production was increased due to the good rinsing obtained not only after the alkali dip but also after the zincate immersion. Previously it was necessary to rinse for 3 to 5 min to completely remove the last traces of the viscous sodium zincate. This is a considerable source of trouble as the drag-in of this highly caustic solution unbalances the brass plating bath and results in poor adhesion. The pH of this brass bath is extremely critical as high pH favors the solution of the extremely thin zincate film.

This aluminum plating installation has now been operating for four months with rejects running less than 1 pct. Excellent finish is obtained and soldered parts when tested would rupture the aluminum before the plate would lift.

There is also considerable demand for a natural Alumilite finish for many types of metal fixtures. It has been found that the addition of magnesium to aluminum in the melt produces an alloy which, when polished, closely resembles chromium plate. Unfortunately, slow oxidation of the aluminum will in time dull this brilliant finish.

Anodizing the highy polished aluminum in the familiar 18 pct sulphuric acid bath will prevent this dulling of the finish by putting a transparent oxide film on the surface. However, extreme care must be taken

[1] *Patented process of Aluminum Co. of America*

Improves Aluminum Finishes . . .

Increasing production and lowering rejects in the electroplating or anodizing of aluminum products by the use of rinse water of zero hardness after alkaline cleaning is discussed in this article. Results obtained from a plating installation incorporating a water softening unit are described.

o o o

By ROBERT S. HERWIG

Chief Plating Engineer,
Bogue Electric Co., Paterson, N. J.

o o o

in controlling the time of oxidation and temperature of the bath. This is necessitated by the solubility of the oxide film in the sulphuric acid at 80° F with the resultant increase in porosity. This will dull the polished finish.

Since earlier experiments with the refrigerated anodizing baths[1] indicated that a hard, dense coating could be produced, experiments were directed along these lines. Reducing the acid concentration to approximately 7 pct sulphuric acid and maintaining the bath at a temperature range of 60° to 65° F produced an excellent finish. Since the bath temperature is not allowed to exceed 65° F, the solubility of the oxide finish has been reduced to a minimum and reducing the acid concentration has produced an extremely hard, dense coating which does not dull the original finish. Another feature of this bath is the excellent finish obtained when it is necessary to paint a thin coat over a buffed finish. The adhesion is excellent and there is no blistering even if baked.

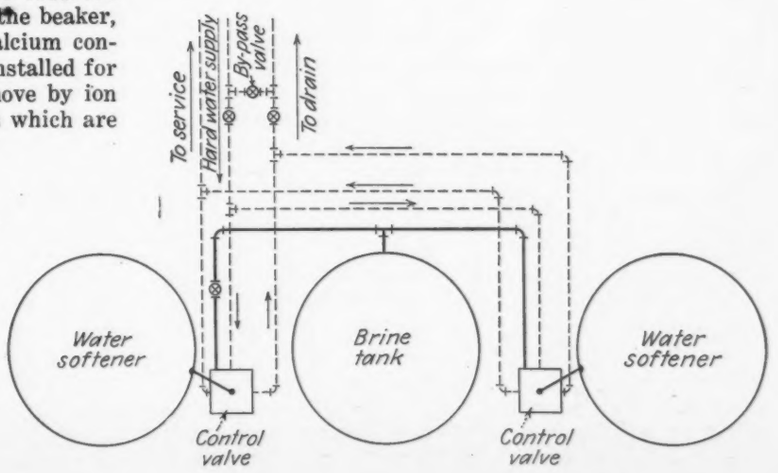
[1] *Herwig, Monthly Review, June,* 1946.

Since the solvent action of the sulphuric acid on the aluminum has been reduced to a minimum, it is essential that a cleaning procedure be installed prior to anodizing. The cycle found to give excellent results was to clean in an aviation type aluminum cleaner and rinse in water of zero hardness. The necessity for again rinsing in softened water is to eliminate the drag-in of alkali and soap curds which not only neutralizes the acid but precipitates magesium and calcium hydroxides on the work which will mar the polished surface.

While the coating obtained in this bath does produce a dense oxide coating, it is subject to staining. To prevent this, it is necessary to seal in hot water. Since the aluminum oxide is converted to aluminum hydrate by the solvent action of the boiling water it will, of course, occlude any impurities present in the water. A good example of this is to take a clean beaker of tap water and boil it down to about a third of the original volume. The impurities in the wall will be observed more clearly and even scum on the side of the beaker, if the water is high in magnesium and calcium content. The same water softener which was installed for producing water of zero hardness will remove by ion exchange, copper, iron and manganese ions which are the cause for most of the staining in the hot water seal.

Summarizing, it has been found in actual practice that production can be increased and rejects diminished by rinsing all work after alkaline cleaning prior to electroplating or anodizing aluminum in rinse water of zero hardess. If it is necessary to seal the finished oxide coating, this same zero hardness water will not introduce any source of trouble caused by staining, for the impurities which are the cause of this condition have been removed in the same ion exchanger.

Rinse water of zero hardness and essentially free of iron, copper and manganese can be readily obtained by installing an inexpensive and easily regenerated cation exchanger of the Belcolite type in the main water supply. This is not only recommended but is necessary if the rinse water is over 6 grain hardness and if the maximum performance from aluminum finishing baths is to be expected.



o o o

FIG. 2—Piping arrangement for a duplex water softening installation.

o o o

Welding Stabilized 18-8 Stainless

o o o

By R. J. HAFSTEN

o o o

Stabilizing 18-8 stainless steel with columbium or titanium eliminates intergranular corrosion difficulties encountered in welding caused by heating the steel to the sensitizing range. Formation of ferrite in the austenite grain boundaries adversely affects physical properties, as brought out by the author in a microstructure study of phase changes occurring during welding, presented in this article.

EARLY attempts to weld 18 chromium—8 nickel stainless steel met with success insofar as the process of joining the parts was concerned, but the susceptibility of the weldment to intergranular corrosion presented a most serious problem. Of course, the metallurgist knew that heat treatment after welding would restore resistance to corrosion, but this was not always possible or practical.

Intergranular corrosion is caused by the precipitation of chromium carbide in the austenite grain boundaries and takes place in the following manner. If an 18-8 austenitic stainless steel is heated in the range of approximately 900° to 1500°F, carbide will be deposited at the austenite grain boundaries. The carbide is a chromium-rich phase and it is assumed that in its formation, chromium diffuses from the zones adjacent to the grain boundaries to unite with the carbon. This depletes the chromium content to a point that the zones no longer possess their former resistance to intergranular corrosion. It follows that during welding a portion of the parent metal will reach some temperature in the approximate range of 900° to 1500°F with the result that carbides precipitate and a condition, which is vulnerable to corrosive attack, will exist.

The addition of titanium or columbium to an 18-8 analysis has eliminated this so-called weld decay and has made 18-8, with these elements added, widely used for welding applications. The role of these elements is to combine with the available carbon, forming columbium or titanium carbides, leaving chromium in solution so that the corrosion resistance is unimpaired. It is the purpose of this article to discuss the effect of these elements on microstructure and corrosion resistance.

When 18-8 steels are heated in the vicinity of 2400°F, areas of ferrite are developed—the amount of ferrite decreasing with an increase in nickel or carbon. Silicon, molybdenum, tungsten, vanadium, chromium and titanium, act in an opposite way and increase the amount of ferrite. Titanium, a vigorous ferrite former, modifies the structure of the weld and adjacent areas so that instead of a purely austenitic structure, one which consists of austenite and ferrite is formed. When conditions are such that carbide

precipitation takes place, the carbide does not precipitate altogether in the austenite grain boundaries, but seems to favor the ferrite areas. Although many investigators believe this structure is not deleterious, Inglis and Andrews[1] have observed service failures that were believed to have been caused by the presence of ferrite or ferrite-carbide.

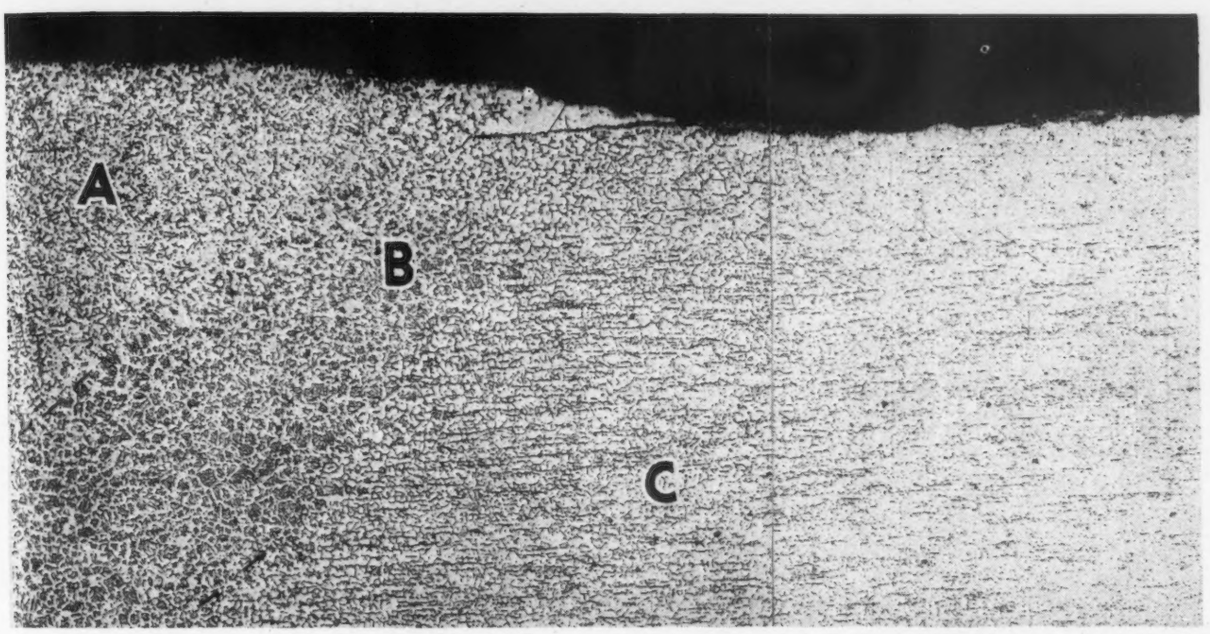
Tests were made on welded samples prepared from 0.052-in. thick sheet of titanium and columbium-stabilized 18-8 steel, the analyses of which are listed in table I. Columbium bearing 18-8 electrodes and gas welding rod were used exclusively in the arc and gas welding processes. After welding, specimens were stabilized at 1600°F for 1 hr and sensitized at 1200°F for 2 hr. All specimens were subjected to intergranular attack by immersion in boiling solution of copper sulfate-sulfuric acid (Strauss solution) for 48 hr. The specimens were then given 180° bend along and parallel to the weld. Usually if intergranular penetration has taken place the specimen will fail during bending. The bend test may not be entirely adequate, for it is possible that a brittle phase may exist and the sample containing it may fail (only because of its brittle nature and not because of intergranular corrosion), nevertheless the bend test is a popular one, and is used here. It was observed that arcwelded titanium-stabilized steel was more resistant to intergranular corrosion as measured by the bend test than the same steel when gas welded, and columbium-stabilized gas welded 18-8 better than the titanium type AISI 321 stainless steel. Hubbell[2] under similar testing also found arcwelds satisfactory in resistance to intergranular corrosion. The reasons for variations in properties were not readily apparent but it was believed that the cause could be found by studying the microstructures of the welds.

[1] *W. P. Inglis and W. Andrews, Iron and Steel Institute Welding Symposium* 1, 1935, *p.* 259.

[2] *W. G. Hubbell, "Result of Stabilizing Heat Treatment on Welded* 18-8 *Stainless,"* THE IRON AGE, *June* 21, 1945, *p.* 56.

Arc and Gas Welded AISI 321

All arcwelded specimens made on the titanium-stabilized 18-8 passed the bend test, whereas all gas



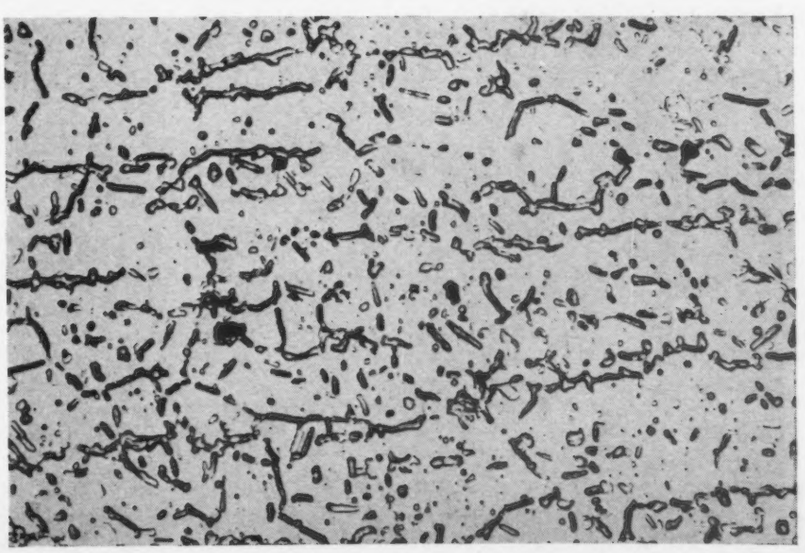
ABOVE

FIG. 1—Gas weld (and adjacent parent metal) made on AISI 321, titanium 18-8 stainless steel. *A* is the weld metal, *B* the fused parent metal and *C* the heat-affected zone containing ferrite in the grain boundaries. Treatment — as welded; etch-electrolytic 10 pct sodium cyanide. 75X

o o o

RIGHT

FIG. 2—Zone *C* of fig. 1 showing ferrite in the austenite grain boundaries. Etch-electrolytic 10 pct sodium cyanide. 500X



LEFT

FIG. 3—Arcweld (and adjacent parent metal) made on titanium-stabilized 18-8 AISI 321 steel. Treatment—as welded; etch-electrolytic 10 pct oxalic acid. 25X

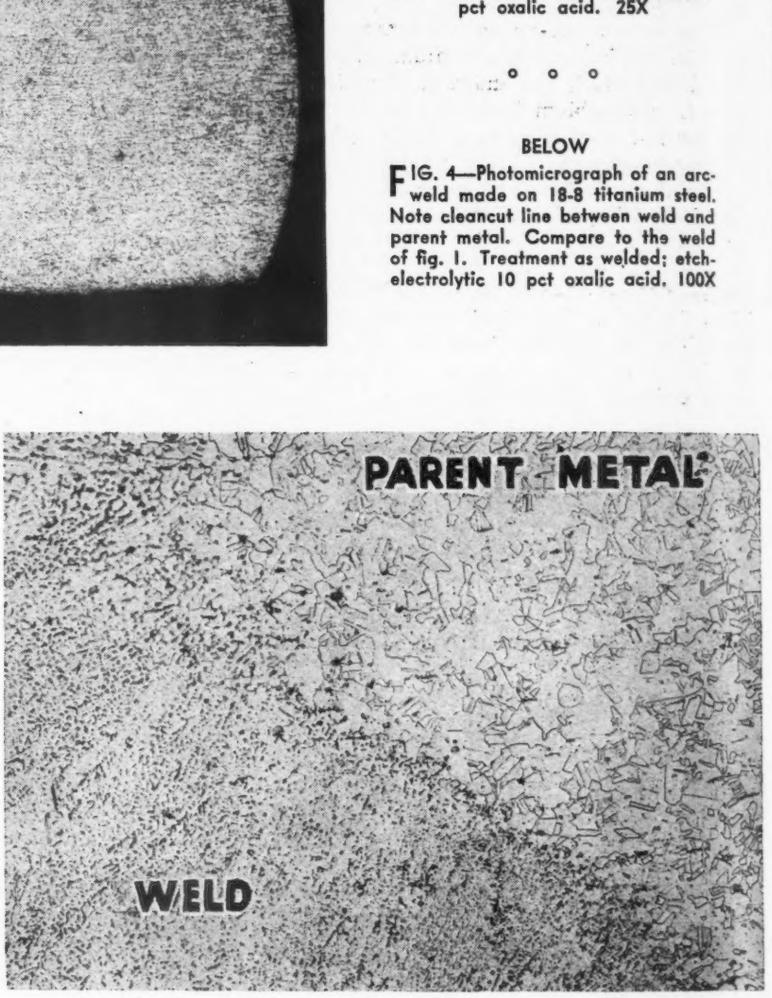
o o o

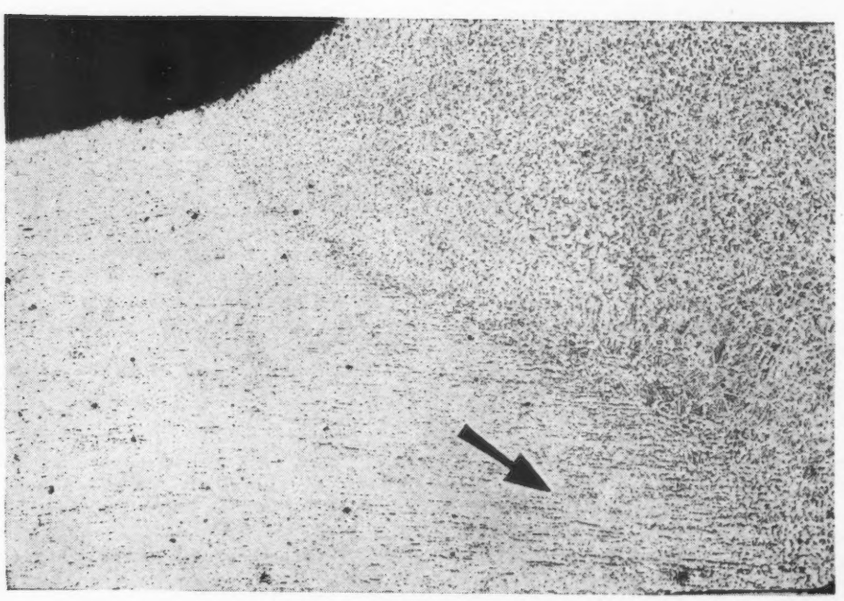
BELOW

FIG. 4—Photomicrograph of an arc-weld made on 18-8 titanium steel. Note cleancut line between weld and parent metal. Compare to the weld of fig. 1. Treatment as welded; etch-electrolytic 10 pct oxalic acid. 100X

TABLE I
Chemical Compositions of Stainless Steels Tested

Element	Type AISI 321	Type AISI 347
Carbon, Pct	0.07	0.07
Manganese, Pct	1.26	1.68
Phosphorus, Pct	0.019	0.016
Sulfur, Pct	0.015	0.018
Silicon, Pct	0.53	0.40
Nickel, Pct	9.60	11.07
Chromium, Pct	18.67	19.71
Titanium, Pct	0.60	....
Columbium, Pct	....	0.76





LEFT

FIG. 5—Arcweld made on 18-8 titanium-stabilized steel. A small amount of ferrite is present—greatest concentration is indicated by arrow. Treatment—as welded; etch-electrolytic sodium cyanide. 75X

o o o

RIGHT

FIG. 7—Gas weld (and adjacent material) made on AISI 321, 18-8 titanium stainless steel. Zone *A* is weld and fused parent metal, *B* is austenite-ferrite zone and *C* is unaffected parent metal. Treatment-as welded; etch-electrolytic 10 pct oxalic acid. 25X

welded specimens of the same material failed when tested under identical conditions. Fig. 1 shows the microstructure of a gas weld made by joining 18-8 titanium type AISI 321 steel. The structure adjacent to the weld is a duplex one, consisting of austenite and a network of ferrite in the grain boundaries. Zone A represents the weld metal, B the fused parent metal and C the unfused parent metal. Zone C has evidently been heated above 2400°F with the result that a ferrite phase has been formed in the grain boundaries. Fig. 2 shows this phase at higher magnification. Figs. 3 and 4 reveal the microstructure of an arcweld made on the same material. It is evident, that in comparison to the gas weld of fig. 2, only a small amount of ferrite is observed to be present (refer to fig. 5). This indicates that more reactions in the solid state take place in gas welding than in arcwelding. The distribution of the welding heat probably accounts for the contrasting miscrostructures. Arcwelding produces a concentrated heat with a minimum amount of heating of parent metal whereas in gas welding the parent metal is heated to high temperatures which results in a complex heat-affected zone and, possibly, susceptibility to corrosion. Fig. 6 shows a photomicrograph of a test specimen that had been subjected to a 180° bend. It can be seen, that failure occurred in the austenite-ferrite zone and not in the fused parent metal where titanium might be deoxidized out. The belief that failure in titanium steels is the result of a decrease in titanium content, due to combination with oxygen during welding, at least in the case of this work, is not valid, since the failure took place in a zone where no melting occurred—making a titanium loss improbable.

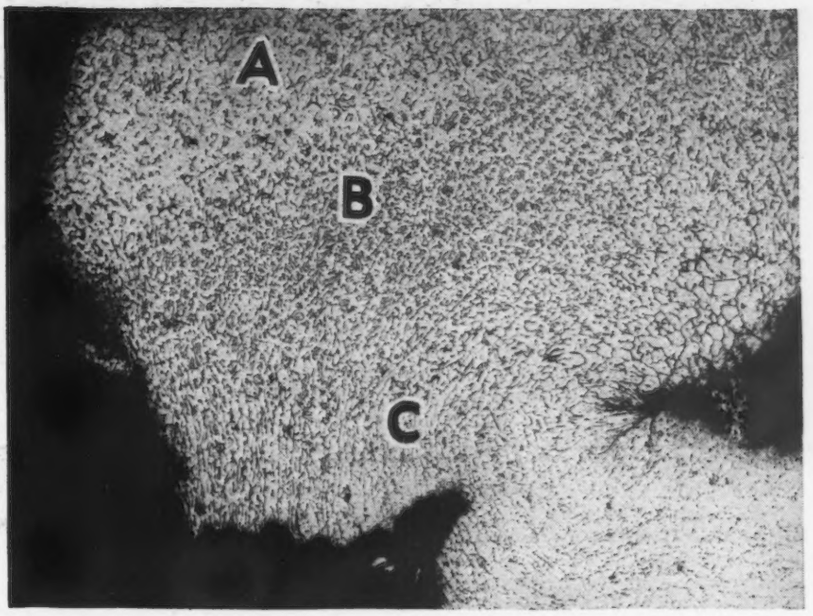
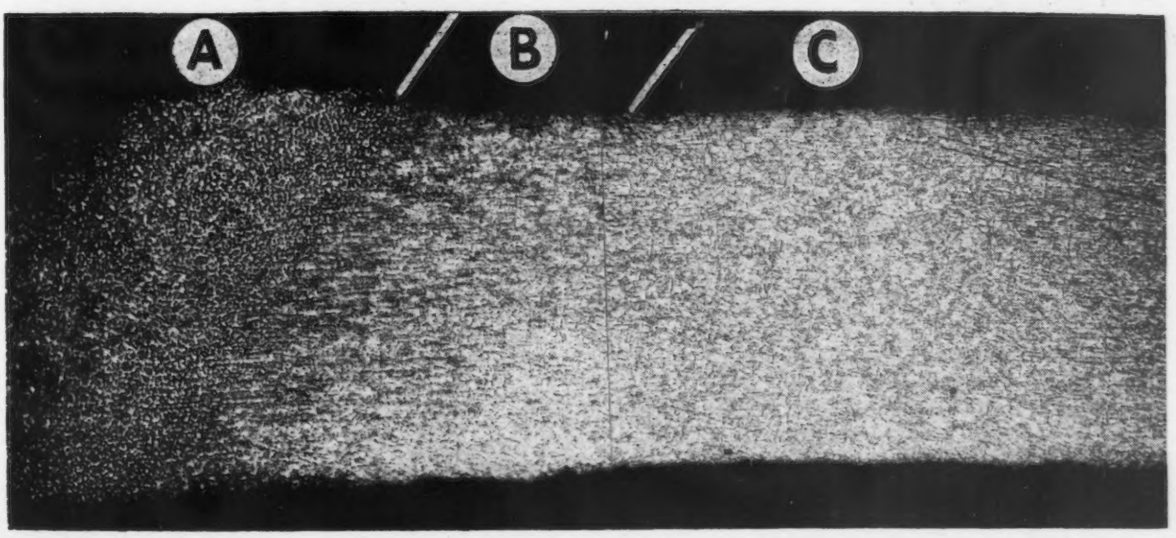
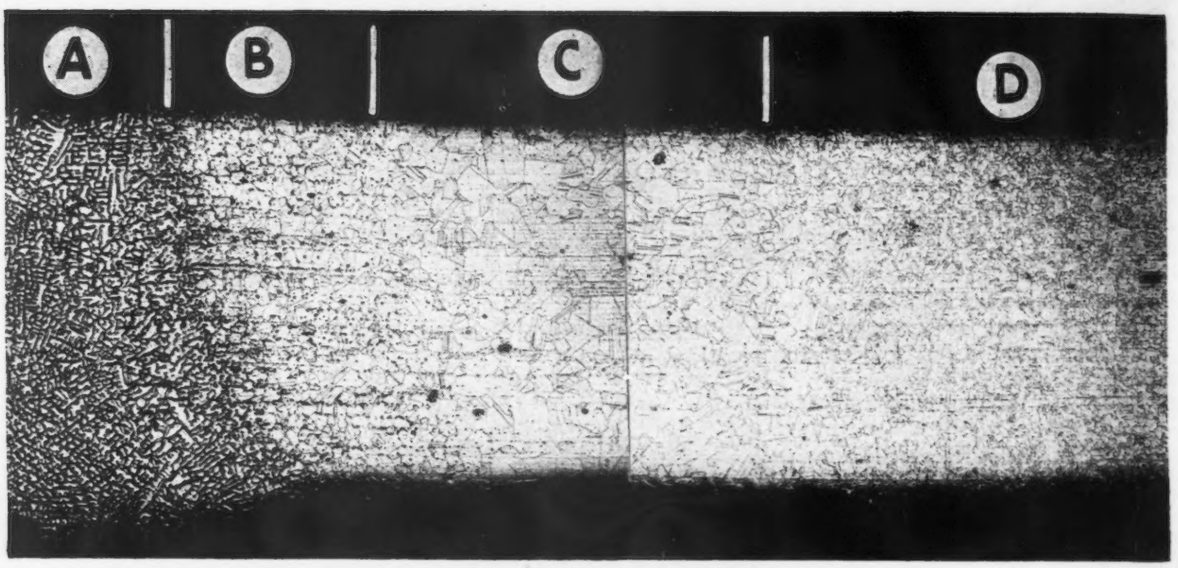
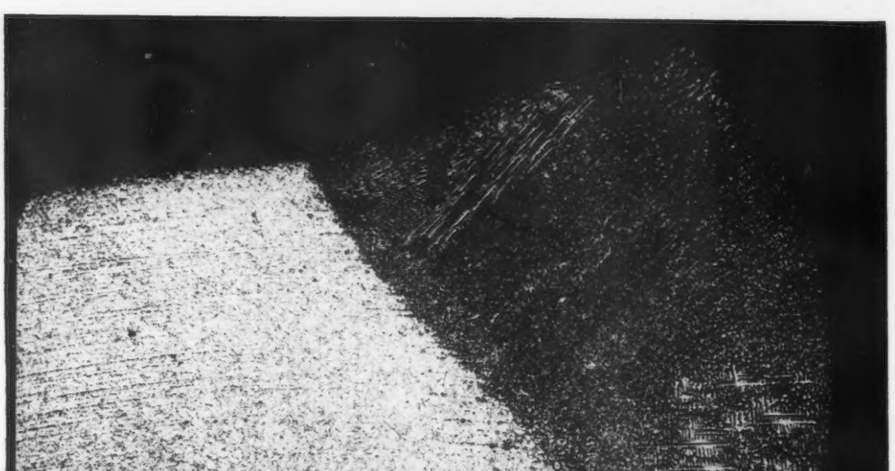


FIG. 6—Photomicrograph of an 18-8 titanium gas welded specimen that failed in bend. Zone *A* is weld metal, *B* is fused parent metal and *C* is heat-affected zone containing ferrite in austenite grain boundaries. Treatment—stabilized at 1600° F for 1 hr, sensitized at 1200° F for 2 hr, immersed in boiling copper sulfate-sulfuric acid solution for 48 hr. Etch-electrolytic 10 pct sodium cyanide. 75X

All columbium-stabilized specimens subjected to the boiling acid solution passed the bend test without cracking. It was mentioned previously that all gas welded titanium 18-8 samples failed in bend. Figs. 7 and 8 show the microstructures that may give some clue for the superiority of columbium 18-8 over titanium 18-8 under conditions of the test. Fig. 7 shows a photomicrograph taken across a weld made on titanium 18-8 steel. Zone A represents the weld and fused parent metal and B the ferrite-austenite zone which is the same as zone C in fig. 1. There appears to be no abnormal grain growth probably for the reason that ferrite in the grain boundaries inhibits grain growth. Fig. 8 represents a photomicrograph of the general weld area of the columbium 18-8 specimens. It can be observed that the dendritic structure of the weld metal is rather coarse when compared to the weld metal of the 18-8 titanium specimens. The reason lies in the fact that titanium possesses the property that enables it to actually refine the dentritic structure of cast







ABOVE

FIG. 8—Gas weld (and parent metal), made on AISI 347 18-8 columbium-stabilized steel. Zone *A* is weld and fused parent metal, *B* is austenite-ferrite zone, *C* is maximum grain growth zone and *D* the unaffected parent metal. Treatment-as welded; etch-electrolytic 10 pct oxalic acid. 25X

o o o

LEFT

FIG. 9—Arcweld (and parent metal) made on AISI 347, 18-8 columbium-stabilized steel. Treatment-as welded; etch-electrolytic 10 pct oxalic acid. 25X

ferrous metals. Zone B reveals a small amount of a phase to be present in the austenite grain boundaries which is probably ferrite although it has not absolutely been identified as such. Columbium is not known to be a strong ferrite former which undoubtedly accounts for the absence of large amounts of ferrite in the heat-affected zone. Grain coarsening in the microstructure is evidence that the zone in which it occurs reached some temperature in excess of 2000°F—for grain growth takes place slowly up to this temperature but rapidly in the 2000° to 2400°F range. Inasmuch as the time at temperature during welding is very short it is safe to assume that in zone C temperatures greater than 2000°F were reached. The growth of the austenite grains of zone B, which reached a higher temperature than zone C, was checked by the phase in the austenite grain boundaries. With the exception of the grain coarsening, the columbium 18-8 type AISI 347 gas welds approach in appearance the microstructure of the arcwelds and especially noticeable is the small amount of material in the grain boundaries of the zone adjacent to the weld. For comparative purposes an arcweld made on columbium-stabilized 18-8 is shown in fig. 9. It is obvious that no grain boundary phase exists. This microstructure is probably ideal insofar as resistance to intergranular penetration, for the parent metal is unaffected by the welding heat.

Conclusions

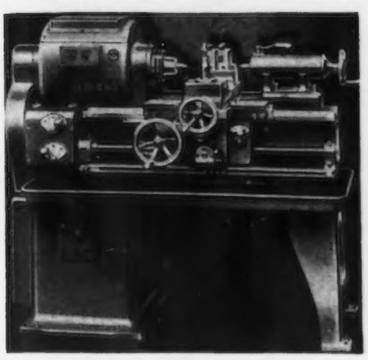
The photomicrographs of arcwelds made with columbium-bearing 18-8 electrodes on titanium and columbium-stabilized sheet, and gas welds made on columbium 18-8 stainless sheet indicated that the good performance of specimens so made was due to a minimum of metallurgical changes taking place in the parent metal. Also the failure of gas welded titanium 18-8 specimens, when bend tested, appears to have been caused by ferrite or a ferrite-carbide structure in the grain boundaries. Titanium and the nature of the welding heat are undoubtedly responsible for the presence of the ferritic phase in the austenite grain boundaries, after welding.

New Equipment . . .

Machine Tools

Various types of standard and special-purpose lathes, Swiss automatics, floor and bench-type milling machines, thread mills, thread and standard grinders, and metal sawing and slitting equipment are featured in this week's digest of manufacturers' announcements.

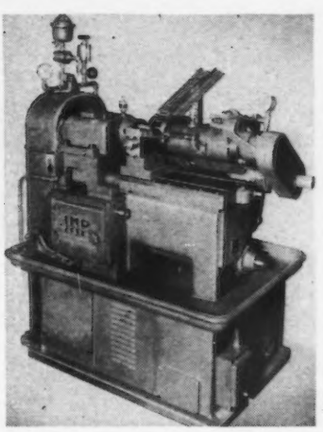
TWO essential elements of an electric motor, the stator and rotor, are built integral with the headstock in the redesigned 13-in. motor head rapid production lathe



which is manufactured by the *R. K. LeBlond Machine Tool Co.*, Cincinnati 8, for light cutting at extremely high speeds. Instead of the usual gears and belts, the headstock contains a stator bolted to the casting, and a rotor pressed onto the spindle. This motor head operates at 5 hp at top speed, and is said to run quietly without vibration at speeds as high as 3600 rpm. A simple electric start-stop box replaces the usual levers and handles. All controls are less than arm's length from the operator. Various attachments such as those used on the standard 13, 17 and 20-in. LeBlond rapid production lathes are also available for the new motor head.

Double-End Drive Lathe

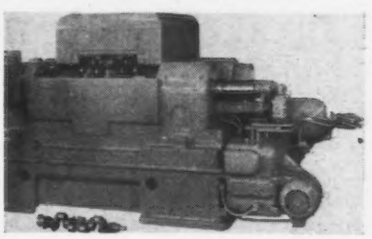
A DOUBLE-END drive automatic IMP lathe with automatic rotary loader for turning valve guides and similar parts has been offered by the *Seneca Falls Machine Co.*, Fyfe Bldg., Seneca Falls, N. Y. The drive to both spindles is by pulleys and V belts from a splined jackshaft extending along the rear of the machine. The advantage of this double-end drive is said to be two-fold: First, since the piece is driven from both ends, much coarser carriage feeds are possible; secondly, inasmuch as both spindles are driven, there is no wear on the revolving centers. The machine is entirely automatic. Valve guides which have been previously bored to size are placed in a loading chute and fed by gravity into openings in the rotary loader. The loader indexes the pieces to the proper position where they are automatically picked up by the continuously revolving spindles of both heads. The slots in the rotary loader are slightly larger than the rough parts, thus permitting sufficient clearance for them to revolve



while held between centers. The OD is turned to size with a single carbide tool, or rough and finish turned in the same operation with two separate carbide tools. The piece is automatically ejected at the end of the cut.

Crankpin Lathe

DESIGNATED as Model MP-4, an automatic multiple crankpin turning lathe of the single spindle type for either cheeking and rough turning or finish turning, spacing and filleting all crankpins simultaneously on multiple throw crankshafts having any number of crankpins, has been produced by the *Wickes Brothers*, Saginaw, Mich. The size is said to be

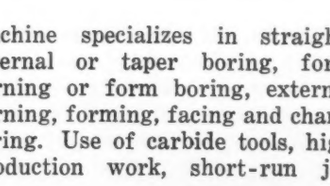


suitable for accommodating automotive type crankshafts weighing 30,000 lb net. Tooling consists of roller supported type tool holders for each crankpin, hydraulically operated pot chucks which hold and drive the crankshaft from each end, and hydraulically operated steady rests for supporting the crankshaft where required. Tool feed is hydraulic and the lathe is completely automatic in operation. The machine is provided with synchronized variable speed and feed mechanism for maintaining both the lineal cutting speed and feed per revolution at the maximum permissible during the entire machining cycle. A transfer switch for manual operation enables the operator to jog the spindle around or jog the carriage in and out for set up purposes.

Automatic Chucking Machine

A SINGLE spindle automatic chucking machine, announced by the *National Acme Co.*, 170 E. 131st St., Cleveland 8, is designed for heavy duty, high production machining operations on castings, forgings and tubing parts up to 12-in. diam. Named the Chuck-Matic, this Acme-Gridley chucking

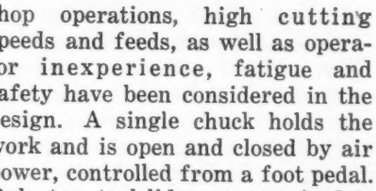
machine specializes in straight, internal or taper boring, form turning or form boring, external turning, forming, facing and chamfering. Use of carbide tools, high production work, short-run job



shop operations, high cutting speeds and feeds, as well as operator inexperience, fatigue and safety have been considered in the design. A single chuck holds the work and is open and closed by air power, controlled from a foot pedal. Only two toolslides are required to mount all cutting tools. The machining cycle, which is automatic, may be instantly interrupted for resetting tools during setup. It is said only a rudimentary machining knowledge is necessary to master the simple four-step operating sequence. Maximum boring length is 3½ in.; turning length, 4 in. A range of spindle speeds from 143 to 524 rpm is provided.

Special Turning Machine

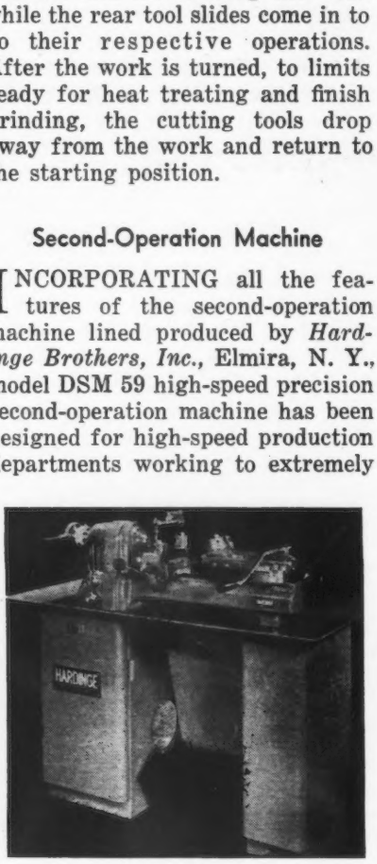
EQUIPPED with front and rear tool slides, a special center drive double-end turning machine has been developed by the *Snyder Tool & Engineering Co.*, 3400 E. Lafayette, Detroit 7. The front tool



slides are for turning various diameters and forming a taper on one end; the rear slides are for facing, chamfering or undercutting. A center drive has three serrated jaws which grip the part which is held between centers, without deflection. The machine operates at the high speed necessary for cemented carbide cutting tools throughout. Production is from 90 to 100 cycles per hr at 80 pct efficiency. Loading is manual and tool feed is hydraulically actuated through an electrically controlled time cycle. Front tools move into position and travel along the work while the rear tool slides come in to do their respective operations. After the work is turned, to limits ready for heat treating and finish grinding, the cutting tools drop away from the work and return to the starting position.

Second-Operation Machine

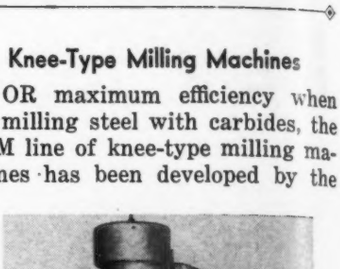
INCORPORATING all the features of the second-operation machine lined produced by *Hardinge Brothers, Inc.*, Elmira, N. Y., model DSM 59 high-speed precision second-operation machine has been designed for high-speed production departments working to extremely



close tolerances and finish specifications. Added features of the new machine are the steel bed ways of improved dovetail design; a three-point mounting of the bed, on the welded steel pedestal base; and a preloaded ball bearing spindle construction in the enclosed headstock. The spindle is ground to take standard 1-in. capacity 5C Hardinge collets and 6-in. capacity step chucks. The spindle nose is supplied with either the Hardinge standard taper nose or standard threaded nose for direct application to step chuck closers, jaw chucks and face plates. The headstock spindle is driven by a center-drive belt which is easily replaceable without removing any part of the machine. The turret operating lever is adjustable for height to suit the operator, and for length so that the most convenient operating position is easily obtained.

Knee-Type Milling Machines

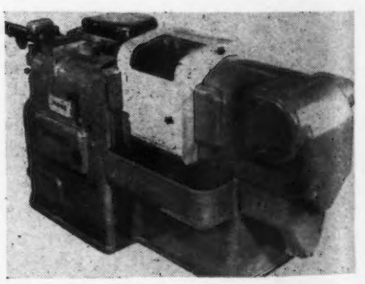
FOR maximum efficiency when milling steel with carbides, the CSM line of knee-type milling machines has been developed by the



Kearney & Trecker Corp., Milwaukee 14, in horizontal and vertical models of 20, 30 and 50-hp sizes. The solid-back column of the CSM has the spindle drive motor cross mounted in the base. Power is transmitted to the spindle through multiple V belts and the spindle speed selection box, and provides 16 quick-change speeds from 50 to 1250 rpm. A feed and rapid traverse drive motor mounted on the right side of the knee furnishes power to the table feed mechanism with 32 quick-change feed rates from ⅜ to 90 ipm provided. Climb cutting equipment is provided for the table.

Single Spindle Swiss Automatic

INDEPENDENT control of 12 individual working tools is said to permit carbide tooling to be used for all operations common to screw machines in the Tavannes single

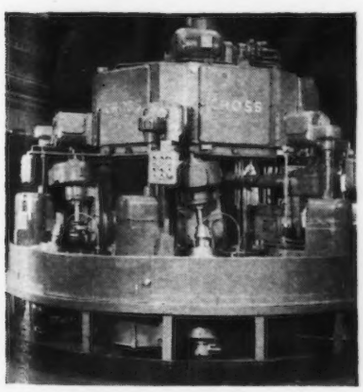


spindle automatic, which is marketed by *Commentry Industries, Inc.*, 260 W. Broadway, New York 13. On these automatics, available working positions are divided into six stations for side slide opera-

tions and six turret positions. Each of the six turret tools can be rotated independently of the other, when a turret unit containing six revolving spindles is in use. Stock feeding is done by recoiling the headstock spindle back along the bar stock to the desired point of gripping. The stock is then fed forward through a revolving guide bushing, past the side slide tools and into the turret tools, as they are sequenced into working position. As the guide bushing is located very close to the point of cutting action, unusually long work can be machined without the use of separate stock rests. Close size tolerances can also be held, it is said, as the work is constantly supported at the point of maximum cutting pressure. The machines are built in two capacities: M-40 for bars up to 1⅝-in. diam, and M-60 for bar stock of 2⅜-in. diam. Maximum turning length is 7⅛ in.; with special tooling arrangement, work up to 9 in. in length can be turned. The greatest distance of side slide stroke is 1 3/16 in. for both machine capacities. Fifty-one spindle speeds are available.

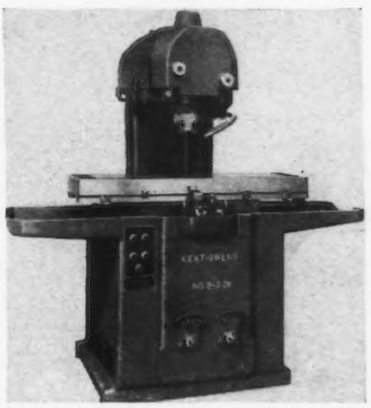
Rotary Thread Mill

SPECIALLY designed to mill taper threads on 19 different models of oil drill cutters, a rotary thread milling machine has been built by the *Cross Co.*, 3250 Bellevue Ave., Detroit 7. Six self-contained, independent work stations are mounted on a circular bed with variable rotary feed. The feed is timed so that each station automatically completes the milling on one piece of work during one revolution of the bed past the operator's station. The operator has only to unload and reload the pieces as the stations pass him. In the automatic work cycle, the motor-driven milling head quick-approaches to cutting position. With the cutter turning, the work head spindle spiral-feeds the piece upward into the cutter, and upon completion of the cut, the milling head moves back to idle position, the workhead lowering while the spindle reverses. Production is from 20 to 40 oil drill cutters per hr, depending on the thread length of the various models.



Vertical Milling Machine

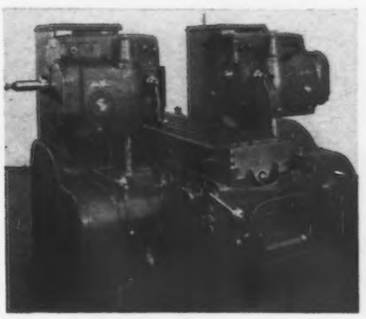
ADDED to the line of milling machines manufactured by *Kent-Owens Machine Co.*, 970 Wall St., Toledo 10, is the Model 2-20 vertical mill, characterized by rugged simplicity, with the bed, column and head all sturdy case members. A heavy table, guided by



dovetail slideways directly cast to the bed, affords maximum support to the table, which is 42 in. long x 12 in. wide with a 20-in. travel, having a fully automatic cycle. It can be fed or rapid traversed in either direction, automatically shifted from rapid traverse in either direction, and automatically reversed at both ends of the stroke. Independent adjustment of the feed rate for opposite direction of table travel makes possible milling a part at one end of the table at a slow feed rate and also setting up an entirely different job at the other end requiring a faster feed rate. The feed can also be set at the same rate for both directions of table travel. The standard machine has a maximum gap of 10 in. between the nose of the spindle and the table surface. A wide range of spindle speeds may be obtained by changing spline mounted pick-off gears contained in the head.

Milling Machines

OFFERING improved performance in high-speed carbide milling and rapid metal removal, a

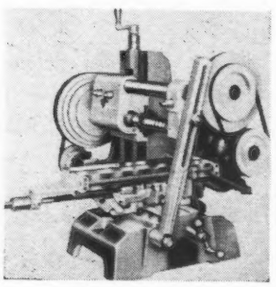


line of Hydromatic milling machines has been introduced by the *Cincinnati Milling Machine Co.*, Cincinnati 9. These machines feature heavier and more powerful construction, with increased cutting capacity and higher spindle speeds. Like the superseded models, the new machines are of bed-type construction, with automatic table feed cycles, and infinitely variable hydraulic table feeds. Standard machines are built in plain and duplex styles, and in 12 sizes, 24-in. table traverse, 7½ hp, to 90-in. table traverse, 30 hp. Tables are 2 in. wider than before, and ways are square gibbed. Along with the heavier headstock and spindle carrier castings, the drive is also heavier, with wider faced gears, larger shafts and bearings, and a heavier spindle. To assure a smooth flow of power to the spindle, the entire speed transmission including the pick-off gears are spiral, bevel or helical. The vibration damper construction of the overarm now has a built-in unit which is said to arrest vibration at the outboard end of the arbor.

Bench Mill

BY incorporating performance characteristics found in large milling machines, the Armor bench type mill has been built, to aircraft specifications, by *Aircraft Machinery Corp.*, Burbank, Calif., and is said to deliver accurate and high-speed production and do intricate tool work. The Armor features a rise and fall spindle, eliminating the conventional knee. The horizontal spindle nose is designed with standard lathe threads externally for lathe operations, such as mounting chucks and face plates. It will swing 22 in. Small bar stock

can be fed through the taper spindle and accurate jig boring can be done, it is said, using rods and indicator. Hand screw feed is standard equipment, but lever feed assembly can be used for faster production at any time, in place of lead screw, converting from tool to



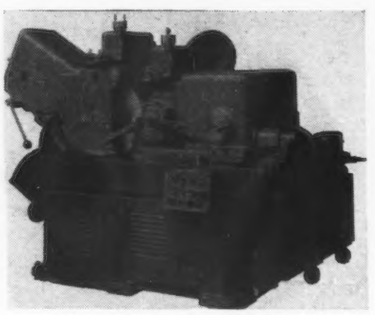
production milling. An automatic power feed is available which drives the table in either direction, independent of spindle rotation. Feeds range from ¼ ipm for high-speed cutters through 32 steps to a 15-in. feed for carbide tipped cutters. These feeds are available from 0.0015 to 0.013 in. per spindle revolution. Eight spindle speeds provide a range from 98 to 1140 rpm. Travel in this Armor mill is 12-in. longitudinal, 10-in. vertical and 7-in. cross travel. A heavy-duty vertical attachment converts the horizontal machine into a standard vertical milling machine.

Electrical Tools

A LINE of electrical tools now being manufactured by the *Bradford Machine Tool Co.*, Evans St., Cincinnati 4, includes a Metal Master grinder, which incorporates an extra heavy duty motor, oversize ball bearings, and semisteel guards. Other features include push button station with starter having overload protection and under voltage release, waterpot, tool tray, and spark breakers. This new Bradford line will include lathe grinders, automotive equipment, disk sanders, adjustable speed snagging grinders, polishers, nut runners.

Centerless Thread Grinder

ANNOUNCED by the *Landis Machine Co.*, Waynesboro, Pa., as a postwar product, the universal centerless thread grinder is now available for grinding screw threads on straight cylindrical work pieces as well as on headed or multiple diameter parts. The machine incorporates the necessary mechanisms and controls for grinding by either the thrufeed method or infeed method, by applying the proper tooling for any specific operation. Single diameter work pieces are thread ground by passing the work pieces in a continuous flow between grinding and regulating wheels. Headed or shouldered work pieces are ground by the infeed method, which operation completes the entire thread in 1½ revolutions of the work piece. Work pieces are placed between the wheels one at a time and are automatically ejected at the completion of the grinding operation. Grinding and control wheels can be dressed without disturbing the setup and, when equipped with an extra coolant tank, a complete change in coolant can be made in a few minutes. The operating controls are centralized at the front of the machine and all mechanisms are enclosed and protected from grit and coolant. An electronically controlled drive provides variable working speed range to the control



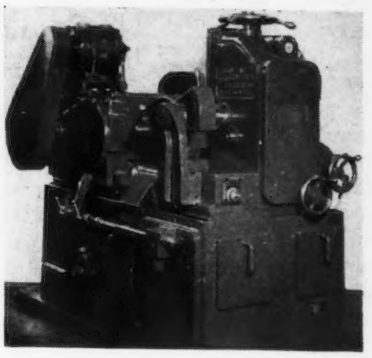
wheel and a preselected fixed speed for dressing the wheel.

Buffer and Grinder

DESIGNED especially for use in blacksmith shops for the grinding and buffing of plow shares, and other long, odd-shaped pieces, and adaptable to a wide variety of other shop jobs, a low pedestal type buffer and grinder has been announced by the *Hobart Bros. Co.*, Troy, Ohio. There is 40 in. of working space between the wheels. The low pedestal enables the worker to sit at the work, bracing the work piece between his knee and the buffing wheel. The grinders are fabricated from rolled and electrically welded steel sheets, insuring lightweight and sturdy construction. The 3-hp motors, operating at 1750 rpm, are repulsion-induction if single phase, or squirrel cage induction if three phase, using current in proportion to the load.

Metal Sawing Machine

ANNOUNCEMENT of the No. 2 hydraulic feed and hydraulic clamping metal sawing machine for cutting ferrous and nonferrous metals has been made by the *Motch & Merryweather Machinery Co.*,



Penton Bldg., Cleveland 13. Metals up to 6 in., round, square or multiple stock, or up to 12 x 5-in. standard I beams can be cut on this machine, which features positive clamping on either side of the saw blade, antifriction headstock, and single lever control of feeding and clamping. Positive clamping for multiple bars and provision for fully automatic stock feed are other design features. Four saw blade speeds are provided, 30, 41, 58 and 80 sfpm; variable saw blade feeds range from 0 to 15 ipm.

Metal Slitting Machine

THE warehouse metal slitting machine, Model 1773, has been designed by the *Torrington Mfg. Co.*, Torrington, Conn., to produce any desired combination of cuts on any gage of metal within its range. The machine is a compact unit, with housings, payoff, winder and motor drive all mounted on a single welded steel base, 4 x 6 ft. Standard capacity is for 5 cuts (4 strips) in 0.080-in. nonferrous or 0.062-in. mild steel maximum thickness, or an equivalent number of additional cuts in thinner gages up to 12 or 18-in. maximum trimmed width respectively. Maximum OD of the coil is 20 in.; maximum weight of coil, 400 lb. An outstanding feature is a manual adjustment of the top arbor to compensate for wearing down of the cutters, providing a total adjustment of 9/16 in.

Contact KAYDON *of Muskegon*

FOR ALL TYPES OF BALL AND ROLLER BEARINGS 4" BORE TO 120" OUTSIDE DIAMETER

KAYDON BEARING SERVICE IS COMPLETE

KAYDON

The Bearings that say: "It CAN *be done!"*

KAYDON Bearings are helping to "make dreams come true" for designers of modern machinery now making the most of the technological advances of the past several years. Heavy-duty machines capable of greater speed, heavier loads, greater precision in performance, longer life . . . machines capable of greater production at lower costs . . . are being engineered with **KAYDON** bearings.

The **KAYDON** line is so complete, with such a broad line of types and sizes of ball and roller bearings . . . from 4" bore to the unusually large 120" outside diameter bearings . . . that many former handicaps to design are now removed. **KAYDON** Bearings have become known as the line that helps designers say: "It CAN be done!"

KAYDON also offers manufacturers of precision parts the following modern facilities and services: Atmospheric controlled heat treating, precision heat treating, salt-bath and sub-zero conditioning and treatment, microscopy, physical testing and metallurgical laboratory services. • Counsel in confidence with **KAYDON**. Engineers who are specialists in modern bearings will gladly cooperate with your organization.

KAYDON *Types of Standard or Special Bearings:*
Spherical Roller • Taper Roller
Ball Radial • Ball Thrust
Roller Radial • Roller Thrust

THE KAYDON ENGINEERING CORP.

MUSKEGON · MICHIGAN

Assembly Line . . .

WALTER G. PATTON

• High wage rates reflected in metal processing . . . Aluminum bearings are being studied by automotive engineers . . . Incentive pay and uniform wage pattern involved in new strikes.

DETROIT—The installation of specialized machine tools capable of turning out automotive parts at unprecedented rates is not the only result that will inevitably follow the high labor costs which have been saddled on the automotive industry. There are already indications that notable changes in processing and selection of materials are receiving serious consideration by metallurgists and plant managers.

For example, at least one major producer is investigating the possibilities of replacing carburized pinions with martempered pinions. Martempering requires equalization of temperatures throughout the part just prior to transformation to martensite, thereby minimizing distortion and it is hoped that labor charges for straightening will be virtually eliminated by the use of a martempering treatment.

In another case, a large automobile producer has changed his gear specification from SAE 6135, a full-hardening gear steel, to NE 8620, which is a carburizing grade. The shift in steels is expected to eliminate a costly gear shaving operation which is necessary because of distortion of the fully-hardened gear during heat treatment. Most observers are convinced that martempering is going to be given an excellent chance to prove its worth as an economical and dependable heat-treating process during the next few months.

Another significant switch in steel specifications has been made by two automotive producers who have changed from high manganese T 1300 to SAE 4615, a nickel-molybdenum steel. Lack of uniformity of the T 1300 steel resulting in poor finish machining is said to be responsible for the change.

Also attracting attention in automotive circles at the moment is the use of aluminum alloys for bearings. Aluminum alloys containing tin, nickel, silicon and copper have shown excellent ability to resist wear and corrosive attack by organic acids released from lubricating oils. The new bearings support much greater loads for longer periods of time than the babbitt bearings they are replacing and are reported to offer satisfactory resistance to damage resulting from foreign particles.

An aluminum-base bearing with steel backing is also being investigated. This bearing has excellent strength characteristics, particularly at high temperature and fatigue characteristics are said to approach those of much costlier bearings. The use of a steel-back for an aluminum bearing has been made possible by a new method of processing that eliminates the brittle layer between the steel and aluminum which thwarted earlier attempts to use a steel backing.

A particularly attractive feature of aluminum bearings is that production will not be hampered by restrictions on lead and tin and cost is expected to be competitive with babbitt bearings. Automotive engineers who have conducted exhaustive tests on the new materials predict the development of aluminum bearings will accelerate progress in designing internal combustion engines to a considerable extent.

AS the story is now being told, the successful use of Vitallium for turbine blades of gas turbines may have been as much an accident as it was a product of engineering foresight. Early in the scramble to find a metal which would stand up at high temperatures prevailing in gas turbines, it was evident that ability to cast the metal to shape would be highly advantageous since this would eliminate forging difficulties which are characteristic of many alloys designed for high temperature use. The Lost Wax process of precision casting of dental alloys was naturally suggested for the application. It happens, of course, that a popular alloy for dental and medical applications is Vitallium, a molybdenum-chromium-cobalt alloy which has the unique property that human flesh will adhere to it without injury to the flesh or deterioration of the metal.

More because of their long experience with Vitallium than because outstanding elevated temperature properties were expected, some of the early blades were cast from Vitallium. As is now generally known the alloy proved to be one of the most serviceable metals available for use in gas turbines and was widely employed in superchargers and turbojet engines. It would be interesting to know whether Vitallium would have been considered for this important application if engineers and dental alloy suppliers had not been brought together by a common interest in precision casting.

It is becoming increasingly evident that Kaiser-Frazer is leaning in the direction of a car having tried engineering features rather than one which embodies relatively untried design. For example, the Kaiser Special will utilize body-on-frame construction instead of the monocoque construction previously announced. Conventional leaf suspension springs will be used in the rear and the coil type in front instead of the more experimental torsion bar springs.

It is reported that one of the manufacturing difficulties encountered by the front-wheeldrive Kaiser was a gear so designed that as one engineer put it "half of the gear shapers in the world would have been required to build the part in production." Another report has it that it has become nec-

"SHOW-HOW" based on "KNOW-HOW"

Each year the nation-wide staff of "Greenfield Men" save threading tool users dollars, machine downtime and broken production schedules . . . simply by "show-how". (That's "know-how" in action!)

These expertly trained men follow up sales, give advice on new jobs, and straighten out troublesome threading problems. No charge, of course.

That's another big PLUS value when you buy "Greenfield" taps, dies, and gages. You get on-the-spot service from your "Greenfield" distributor *and* the experienced "Greenfield Man" in your locality. *Such service often saves customers more money than their annual tap bill.*

GREENFIELD

GREENFIELD TAP and DIE CORPORATION

GREENFIELD, MASSACHUSETTS

essary to redesign and rebuild paint-drying facilities which are to be used for K-F built bodies, resulting in a further delay in production of bodies at Willow Run. At the present time, Kaiser-Frazer bodies are being produced by Hayes Body of Grand Rapids.

Employment Index of the Detroit Board of Commerce reached 122.5 on June 15 which, compares with 99.7 at the end of May and 139.3 a year ago. The return of Ford workers to their jobs is reflected in the latest rise in the Detroit index.

THE long-range planners of the UAW-CIO and particularly their spokesman, Walter Reuther, have repeatedly emphasized their intention to resist wage incentive plans in any form and to strive for a uniform wage pattern throughout the automotive industry regardless of local or geographical considerations that may logically influence wage rates. An unfortunate consequence of this program is that in many instances the local may be in favor of an incentive pay program and may vote to accept such a plan only to be reversed by the international. There have also been a number of instances in which the international has signed a wage agreement affecting several plants only to find the local refusing to agree to the terms of the new contract.

A recent case in point is the Houdaille-Hershey strike which was reported "settled" as of June 11 when a contract covering all Houdaille-Hershey wants was signed by management and the international union. As a matter of fact, however, the Jackson plant is still out on strike and at present the local is belligerently defying both the international and management in refusing to return to work under the terms of the new contract. In other words, the Houdaille-Hershey strike remains unsettled so far as the Jackson plant is concerned, despite premature reports to the contrary.

It is also interesting to observe that the three month Houdaille-Hershey strike was fought over the basic issues of incentive pay and the application of a uniform wage pattern to all divisions of the company. The union failed to budge the company on these issues as a result of the strike although some upward wage concessions were obtained. Meanwhile, strikes have been called at Long Mfg. Co. in Detroit and Sealed Power Corp. at Muskegon involving the same basic issues.

When the issues involved in a strike are of such a fundamental nature it may be anticipated that the strikes will be hard fought by both parties, and prospects for an early settlement are not good unless a fundamental change of policy is adopted either by management or the union. At the moment neither party to the dispute shows any tendency to weaken, although the union appears to have lost the first round.

UAW Adds to Confusion Attending Passing Of OPA Price Controls

Detroit

• • • **As predicted,** the UAW-CIO has added to the confusion attending the passing of OPA from the local scene by announcing that a two-front offensive will be opened: (1) The union will organize Detroit tenants against real estate interests and (2) the union will attempt to enlist the buying public behind its efforts to organize a consumers' strike as a protest against price advances.

Otherwise, Detroit seems to be following about the same course as is being adopted by the nation as a whole. A number of landlords here are expected to notify their tenants within the next few days that rents will be raised from 10 to 20 pct in 30 days. Michigan law requires a 30-day notice for either rent increases or eviction.

The recent meeting sponsored by UAW's Political Action Committee was led by Richard T. Leonard, vice-president, and resulted in the organization of a group to lead the fight against rent increases. The Michigan State CIO and Wayne County CIO is expected to join in carrying on a vigorous campaign that some predicted would include picket lines to put evicted people back into their homes and a possible consumer's strike.

Price reaction to the abandoning of OPA was slow in coming here. Grocers and meat dealers appeared to be testing public opinion and were reluctant to announce any substantial price increases. A jump of 2¢ per qt was forecast for the dairy industry. Automobile manufacturers and dealers announced that the fate of OPA would have to be definitely decided by Congress before any action would be taken.

The demise of OPA is expected to have but little effect on Detroit's produce consumption. According to George Thierwechter, manager of the Detroit Produce Terminal, most OPA ceilings have already been removed and many items are now in over-supply and selling at less than the former OPA ceilings.

Erie Orders Additional Rolling Stock from GM

Cleveland

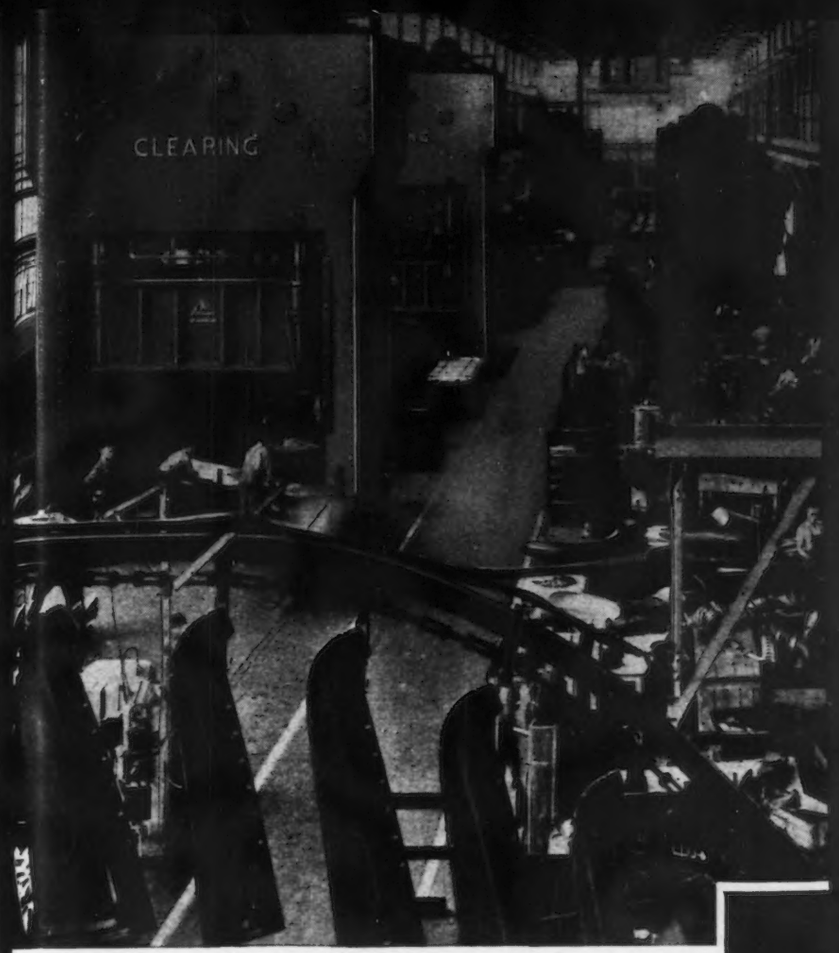
• • • **A total of** 23 more diesel locomotives and an additional 1000 freight cars, costing approximately $7,500,000, are being ordered by the Erie Railroad. Three of the diesels will be of the giant four-unit type, 6000-hp freight locomotives, built by the Electro-Motive Div., General Motors Corp., LaGrange, Ill. Delivery is expected about the second quarter of 1947.

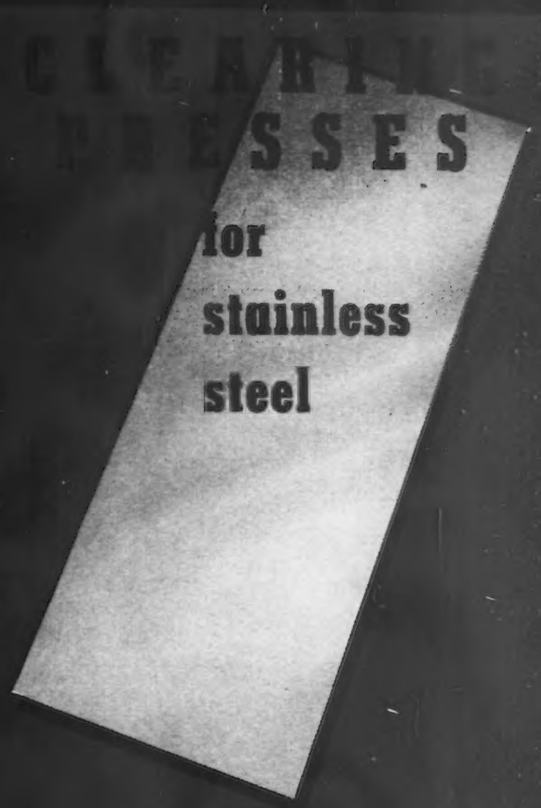
The balance of the diesels will be 20 switching locomotives of which 11 will be 1000-hp, eight 660-hp, and one 380-hp. Delivery is expected during the last quarter of 1946. They will be assigned to freight switching terminals at various points along the line.

Bids have been asked on 1000-all-steel freight cars. These include 500 50-ton steel sheathed boxcars, 200 70-ton drop-end gondolas and 300 50-ton hoppers.

Since the first of the year the railroad has already received 930 new freight cars and 48 all-steel cabooses. Delivery will start next week on 700 box cars still on order.

Earlier this year the Erie placed orders for seven 4500-hp diesel passenger locomotives and seven lightweight modern roomette-bedroom sleepers for use on all through line passenger trains between Chicago and Jersey City. When received, the schedule time of these trains will be reduced by about 2 hr.





Clearing Press Precision for hard-to-work metals

To work materials like stainless steel, Clearing Presses provide the two essentials for successful operation: (1) Smooth flow of power to the slide and (2) proper suspension of the slide to maintain exact alignment of dies under all conditions. The double-action, 1200 ton capacity Clearing Mechanical Presses illustrated here are used for a variety of jobs in drawing and blanking stainless steel. This has included such relatively large parts as drawn and formed sections for bus and diesel truck fuel tanks and locomotive water tanks.

Clearing mechanical press features such as eccentric drive, double guided slide, air clutch and brake assembly, and welded steel construction combine to give unusual press rigidity, extreme smoothness in power transmission and accurate maintenance of die alignment.

Clearing engineers will be happy to analyze your requirements in press equipment at any time. Clearing Presses, either mechanical or hydraulic, can be supplied in any size or type for every production demand.

CLEARING MACHINE CORPORATION

6499 West 65th Street **Chicago 38, Illinois**

OFFICES . . . CHICAGO . NEW YORK . CINCINNATI
CLEVELAND . DETROIT

CLEARING MECHANICAL AND HYDRAULIC PRESSES

for FORMING . DRAWING . BLANKING . FORGING

Washington . . . L. W. MOFFETT

• Secretary Wallace alarmed by increase in corporate mergers and acquisitions . . . American potter firms protest rebuilding Japanese china industry.

WASHINGTON — Hard on the heels of the Justice Dept.'s declaration of renewed warfare on big business (THE IRON AGE, June 27, p. 78), Commerce Secretary Henry Wallace released a department report well calculated to keep alive the torch thrown by Attorney General Tom Clark. Mr. Wallace noted with alarm that there is now evident an accelerated tendency of the big fish to swallow up the little minnows. He delivered himself as follows:

"Since VJ-Day there has been a sharp increase in corporate mergers and the acquisition of small firms by larger ones. In the fourth quarter of 1945, mergers and acquisitions reached the highest level since 1931 and preliminary indications are that the high rate is continuing."

The implications offered by this indicated trend are alarming in their interpretation by the Commerce Dept.

"If it continues for a number of years," Mr. Wallace declared, "it will have important repercussions on the nation's economic system, primarily because competition will be further reduced and the opportunity for small business further limited."

Steel and six other major industries were singled out by the Commerce report as the most "pronounced offenders." In addition to steel, industries showing a marked tendency to expand in this manner were drug and pharmaceutical concerns, distilleries, the dairying industry, paper manufacturing, textile producers, and metal producing and fabricating plants.

U. S. Steel, Bethlehem, Jones & Laughlin, and American Rolling Mill were cited as offenders when THE IRON AGE asked for specific examples. Each of these four corporations, according to a department spokesman, had acquired through merger or outright purchase from six to eight smaller organizations.

* * *

ON WHAT basis these particular steel companies were picked out was not made clear. U. S. Steel, with about 33 pct of the country's ingot capacity, was even given the Dept. of Justice's blessing recently when Attorney General Clark said he did not view the sale of the Geneva Steel plant to the corporation as a violation of the anti-trust laws. Bethlehem has only about 14.1 pct of the country's steel ingot capacity, J & L approximately 5.4 pct and Armco about 3.4 pct. Some of these acquisitions were in the nature of "scrambled" facilities whose disposition to other companies plainly would be impractical. When the percentage of total capacity is down as low as 4 to 6 pct, it creates speculation as to when Mr. Wallace's "alarm" goes off, if he really is alarmed.

All in all, the Commerce report declared, since the beginning of 1940 and through 1945 no less than 122 mergers or acquisitions through other means have been effected in the iron and steel industry, 116 in the field of machinery manufacturers, 26 among automobile and automotive equipment producers, and 22 in the nonferrous metals field.

"The highly liquid asset position of the nation's corporations, their ownership of well-established outlets, and nationwide advertising programs all give impetus to the trend," Mr. Wallace adds as a clincher.

"Most of the mergers occurring from 1941 to 1945 involved nondurable goods industries. However, since VJ-Day an increasing number of durable goods industries have been involved and there has been a spectacular increase in the number of small firms absorbed by larger ones."

In effect, the Wallace statement was an echo of the very comprehensive study of "economic concentration" activities during World War II which was compiled by the now defunct SWPC. The SWPC in itself, might be classified as having been "merged" or absorbed by a larger government "corporation" when its duties, such as they were, were divided between the RFC and the Commerce Dept. Like the SWPC, the Dept. of Commerce made no recommendations, merely releasing its statement "as a matter of public interest."

It is obvious that war expansion of the bigger corporations was due largely to the fact that the big firms received the lion's share of war contracts. In the 359-page report of the dying SWPC it was duly noted that at least two-thirds of the $175 billion worth of prime contracts awarded during the period from June 1940 to September 1945 went largely to about 100 large corporations; it goes even further and calls attention to the fact that 10 of these corporations received approximately one-third of the dollar volume of these contracts. While some of the subcontracting went to smaller concerns, the bulk went to the larger ones which were equipped to turn out needed parts or services on a mass production basis.

* * *

THIS concentration of contracts is no mystery. In wartime, no one stops to count the cost nor to hand-pick the sources of supply; time and efficiency are all that count. Production must be met. During the emergency the government's reliance on big business was such that it financed additions and expansions of existing facilities to the tune of around $25 billion. Having helped the corporations to build their houses still larger, it points the weapon of anti-trust prosecution and tells them to tear them down, now that danger no longer threatens.

Turning NICKEL STEEL AT 230 S.F.P.M.

SUNOCO EMULSIFYING CUTTING OIL

"Job-Proved" under Severe Operating Conditions, Maintains Accurate Cutting Edges on Tools

When heavy cuts and heavy feeds are taken on nickel steel . . . and peak production is to be obtained . . . it is essential to maintain accurate cutting edges with long intervals between grinds.

Here is a case where a manufacturer's preference for Sunoco Emulsifying Cutting Oil is based on that type of performance.

Operation: rough-turning forged spindle
Machine: Monarch Model "M" 20" engine lathe
Surface cutting-speed: 230 feet per minute
Material: S.A.E. 2350
Depth of cut: 3/8"
Feed per revolution: .015"
Type of tool: tantalum carbide
Cutting lubricant: 1 part Sunoco to 10 parts water

Sunoco is "Job-Proved". It has won the approval of leading machine-tool builders and metal-working plants for its outstanding work in a wide variety of tough metal-cutting operations.

Outstanding lubricating, heat-absorbing, and rust-preventive qualities of Sunoco make possible longer runs between regrinds, greater accuracy, better finish, fewer rejects, and worthwhile savings in production time. A test in your own plant will convince you.

SUN OIL COMPANY • *Philadelphia 3, Pa.*

SUN
SUNOCO
INDUSTRIAL PRODUCTS

Perhaps a simpler solution for nourishing small enterprise and restoring competition in a free nation would be to devote more time to assisting the little fellow—who is not nearly so well equipped to survive temporary business fluctuations—and not so much time seeking possible grounds for launching anti-trust suits. At least, this would appear the sensible course until restoration of full production is attained.

* * *

PROTESTS by American potter companies, according to the House Small Business Committee, have caused the War Dept. to abandon plans to recruit and send American ceramics engineers to Japan to aid in rebuilding and modernizing the Japanese china-making industry. Wide interest has been shown in this action because, though it concerned a nonwar industry, it is said it may have nipped similar expeditions looking to rehabilitation of Japanese industry in other fields. This, it was felt, might include metallurgy, despite the recommendations of the National Engineers' Committee. This committee has recommended that Japan's wartime rate of iron and steel production be slashed by more than 80 pct and its wartime machine tool industry be reduced 50 pct.

While the rebuilding of Japanese industries under American direction is officially declared to be designed only to aid Japan to support herself domestically, industrialists have been concerned lest the move, though not so intended, might strengthen Japan in the export market and even add to her war potentiality. It has been a fixed policy to prevent Japan from restoring in any way her war making power.

Shortly after VJ-Day, General MacArthur instituted a policy of placing Japan on a self-supporting basis by bringing certain of her nonwar industries up to a sustenance level, and ceramics was chosen as being within this category.

Pointing out to the House Small Business Committee that in prewar years Japan, with its low wages, had nearly ruined the domestic china industry by flooding the country with cheap chinaware, American pottery companies strongly opposed the War Dept.'s project. They expressed fear that a repetition of that experience would bring disaster to pottery centers in northeastern Ohio and western Pennsylvania because of the centralized nature of the industry. The Small Business Committee said that it passed the protest along to the State Dept. as the agency handling the War Dept.'s recruitment program in this field with the result that the prosposal was dropped.

* * *

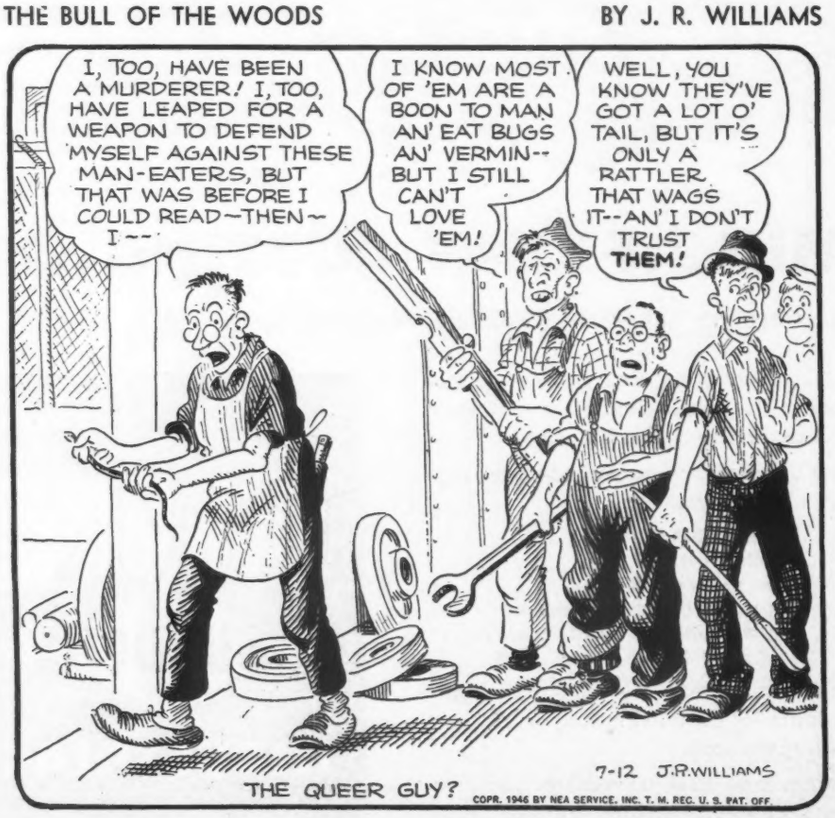
DEPENDENT upon getting sufficient revenue through freight rate increases, railroads are preparing for huge expenditures for new equipment and rails. While a considerable amount of equipment is on order, much larger purchases are contemplated. In their petition for a general 25 pct boost in rates, with some exceptions such as iron and steel, the carriers said that they are greatly in need of new and improved locomotives and freight cars. They estimated that they have as much as 2 million tons of old rail in their tracks due for replacement.

The Interstate Commerce Commission gave recognition to these and other requirements in its recent interim decision granting an average rate increase of 6½ pct, which the carriers declare is entirely inadequate. They hope for more liberal treatment as the result of hearings in the so-called 25 pct case.

Passing upon the railroads need for new equipment, the ICC said that freight cars built during the war reflected outmodel standards. So far as practicable, it was pointed out, wood was used, supplemented by ordinary steel. The lighter alloy steels were not then available, it was added.

"This was also true as to locomotives, 600 of which were constructed according to emergency designs which will shorten their normal expected service life and currently result in maintenance costs higher than normal," the Commission declared.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

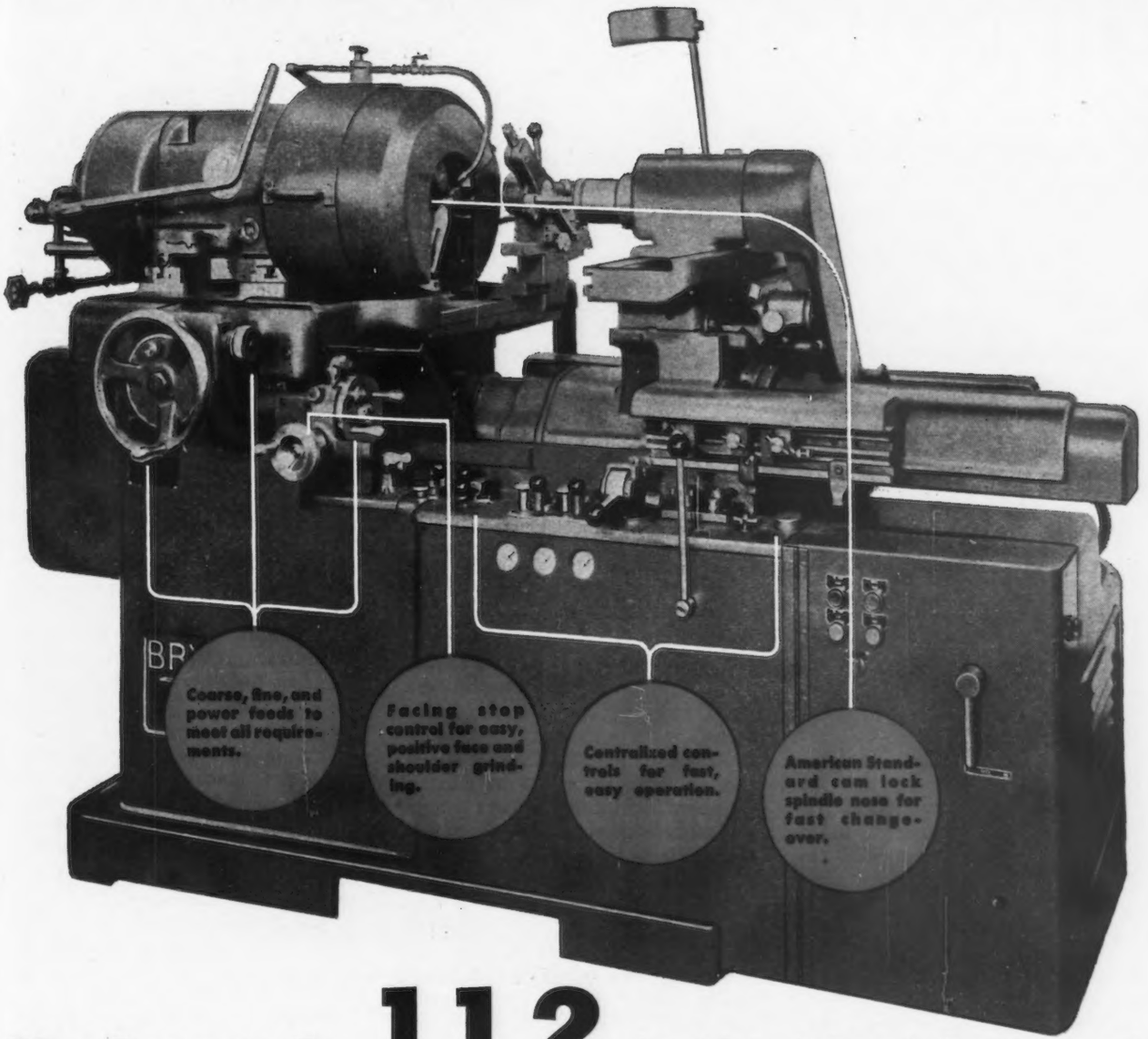


Acid O.H. Steel Output

Pittsburgh

• • • **The Acid Open Hearth** Research Assn. has announced that the total acid open hearth tonnage for 1945 was 1,542,724 tons, of which 746,656 tons was for ingots and 796,068 tons was for castings.

This, it was said, constitutes a drop in tonnage of 564,769 tons under that of 1944, a 27 pct loss.



The BRYANT NO. 112 is the Ideal Internal GRINDER for Small Lot Production

From stem to stern, the Bryant No. 112 Internal Grinder is designed for small lot production. It is truly the *ideal* tool room machine, because every lever, every control, every part was planned to speed the production of short runs or single parts.

There are three feed controls—one for coarse feed for setup, another for power feed for production, and a third for fine feed for precision.

An American Standard cam lock spindle nose allows fastest change of chucks and holding fixtures.

All controls are centrally located so that all of the operator's motions are easy and natural—more work produced with less fatigue.

A universal facing stop (standard equipment) makes face and shoulder grinding an easy, positive operation.

These are only highlights—for complete details on this "ideal" tool room internal grinder, just . . .

Send for the Man from Bryant.

Write for new catalog on the No. 112

BRYANT

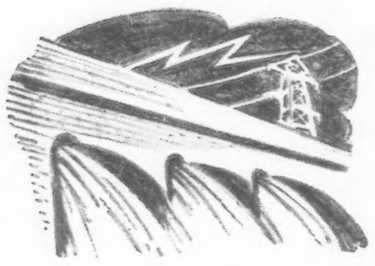
BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

West Coast . . . .

ROBERT T. REINHARDT

• Aluminum production again gets under way at Mead and Trentwood . . . Nail plant rumored for Los Angeles . . . Central Valley Project to use large steel tonnages.



SPOKANE—Resumption of production of aluminum sheets at the Trentwood plant and the scheduled operation of the first pot line at the aluminum reduction plant at Mead within a few days by The Permanente Metals Corp. is having a marked effect on the local industrial picture.

Ever since the plants were leased to the Henry J. Kaiser interests, skeptics expressed doubt that they would actually be put into operation under that management. Present operations have put an end to such conjecture and interest is now centered on the question of just how large the production—and employment—will go. Announced production schedules of sheet, plate and strip this year call for 4 million lb this month; 8 million lb in August; 12 million lb in September; 16 million lb in October; and 20 million lb in both November and December. The latter production is only a little below the 24 million lb per month rated capacity of the mill.

Until the Mead pot lines are reducing alumina to aluminum ingots, Trentwood will operate on pig from the Metal Reserve stock and available scrap. Remelting furnaces have been operating at Trentwood for several weeks to prepare slabs for the rolling mills.

Only one of the six pot lines is scheduled for immediate operation at Mead, but others will be put into production as rapidly as enough alumina is received from the Baton Rouge, La. plant. Present stockpiles are said to be sufficient for limited operations for several months. Rated capacity at Mead is 216 million lb of aluminum ingots per year and the Baton Rouge facilities can produce approximately 2 billion lb of alumina yearly.

Procurement of adequately experienced labor has been a problem since many of the former workers at the two local plants, while operations were under Aluminum Co. of America, have either taken on other steady employment or left the area. However, the experience the Kaiser interests gained during their shipbuilding days has served them well and by the end of this month it is expected that about 2000 men and women will be on the payrolls of the two plants. Capacity operations of both plants will require approximately 3000 employees it is stated.

Although the Bonneville Power Administration has recently expressed doubt that its existing facilities would be adequate to serve the two plants at full capacity along with other newly activated industries, there is no apparent concern on this score locally. Secretary of the Interior J. A. Krug said in Portland, Ore., recently: "The problem is for the Bonneville Administration to determine whether it wants to devote that much of its power to the production of aluminum. It would like to have some power left for other industries."

IN commenting on a possible power shortage Paul J. Raver, Bonneville Power Administrator, stated that operations of the Permanente plants here and the Troutdale, Ore., reduction plant by Reynolds Metals Co. would largely absorb the power administration's current power surplus of 500,000 kw and increase revenues more than $4 million annually.

Production costs at the two plants here are expected to be well in line with those in other parts of the country because of the low power rate afforded by the Bonneville project which is reported by Mr. Raver to be $17.50 per kw-year. Some local businessmen are expecting costs to run about 12¢ per lb which would be better than competitive. Alcoa, which produces its own power at its eastern plants, has an even lower power cost than local plants according to Arthur V. Davis, chairman of the board, so it is still problematical if The Permanente Corp. can meet Alcoa's production figures.

Since the Kaiser interests have become stockholders in a Midwest steel mill and are now in a position to get steel sheets for Kaiser-Frazer automobiles, it is a question whether Mr. Kaiser will proceed with his announced plan of using aluminum sheets for his cars. At any rate, it is known that plans are afoot for a serious merchandising campaign for local aluminum production. Among other possible outlets is said to be the Wilson Foundry & Machine Works of Pontiac, Mich., which reportedly sent one of its vice-presidents, Harry W. Holt, to the West Coast to discuss aluminum sheet supply for a contemplated operation in the West. It is also reported that Mr. Kaiser has plans for the use of large amounts of aluminum in home construction.

Mr. Kaiser, who is well known locally because of his business career here 40 yr ago, is extremely optimistic over the future of the local aluminum industry. He recently stated: "The aluminum industry can be a billion dollar industry in the Northwest."

PORTLAND—Recent purchases of surplus steel in this area by Italian and South American interests are not depriving local users of any scarce items according to the WAA which negotiated the sales.

Sixteen thousand tons of heavy plates and shapes were sold to the Italians for $800,000 to be used for reconstruction; 2700 tons of steel rails and plate and 3000 tons of angles went to South America.

* * *

LOS ANGELES — West Coast spring manufacturers have a new source of material now that Bethlehem Pacific Coast Steel Corp. has put into operation a new stress

relieving furnace at its plant here.

According to L. J. Soracco, general superintendent, the furnace will eliminate the tendency of sensitive types of steel toward air hardening during the cooling process on the mill hot bed. Designed to relieve the stresses resulting from rapid cooling, the 32 ft by 8 ft high by 12 ft wide furnace provides for an additional heat treatment, or subcritical anneal. Underfired with gas as fuel, the furnace has a capacity of 50 net tons per charge. Automatic temperature control is effected by Leeds Northrup four point recording micromax.

Rumor persists that Bethlehem is going into nail manufacturing here, but no confirmation is forthcoming from company officials. It is known that wire drawing facilities are planned for the local plant and the deduction is logical that one of the products will be nails because of the heavy demand at this time. The current price situation make their production a little more inviting.

SAN FRANCISCO—Finally getting approval from CPA for the construction of a $55,000 building, Clingan & Fortier, steel jobbers, is proceeding with plans for installation of approximately $75,000 worth of Yoder equipment for slitting and automatically cutting up coiled sheet stock. Construction of the 225 ft by 50 ft warehouse is under way and as soon as approval can be obtained this will be increased to a building 450 ft by 100 ft. Wire straightening equipment is also contemplated.

* * *

Approximately 3600 tons of reinforcing bars will go into the first 13-mile stretch of the Delta-Mendota Canal, key link in the chain of watercourses comprising the irrigation system of the Central Valley Project. Contractor Hubert H. Everist, Sr., will begin construction of this section of the concrete lined river within a few days. A 100 ft wide and 15 ft deep, the canal will carry Sacramento River water from the Delta 120 miles into the San Joaquin Valley. Westley wasteway is another part of the same project. It is 6 miles long, 16 ft wide at the bottom and 10 ft deep.

According to Richard L. Boke, regional director of the Bureau of Reclamation in Sacramento, Calif., the Bureau is putting all of its available funds into steel and concrete to push the Central Valley Project with all possible speed. Since the end of the war contracts totaling more than $31 million have either been awarded or are about to be.

Particular emphasis is being placed on getting the Friant-Kern Canal completed. Contracts for more than 30 miles of this great waterway have been let and bids were recently opened for another 42-mile section.

The large tonnages of steel involved are being purchased by the Bureau.

Shipyard Swap Awaits Appraisal of Holdings

Washington

• • • **Todd Shipyards Corp.** and the Navy, have made a trade of shipyards. The result is the former will own a government-built yard in Seattle and Navy will own a permanent naval base in Tacoma, Wash. Transfer in title only awaits appraisal of the fair value of Todd's holdings in the Tacoma yard against the appraised fair value of the Seattle yard.

The Todd Corp. was the wartime operator of the Navy-controlled Seattle shipyard and also of the Tacoma yard, owned partly by Todd and partly by the government. Investment by the government in both facilities was more than $20 million.

When Todd expressed an interest in purchasing the Seattle yard and the Navy expressed a similar interest in the Tacoma yard, WAA issued Order No. 1 to SPA Regulation No. 20 to facilitate a transfer.

Dam Contracts Awarded

Washington

• • • **The Bureau of Reclamation** has awarded two contracts to the Joshua Hendy Iron Works, San Francisco, for equipment for the Shasta and Grand Coulee dams. One contract was let at $516,632, for furnishing 14 96-in. outlet gates and hoists to be installed in the 102-in. diameter tubes through the spillway section of Shasta dam. The other contract was let at $310,052 for 1188 trashracks for the power plant at Grand Coulee dam.

The Allis-Chalmers Mfg. Co., Milwaukee, was awarded a contract for seven 115 kv circuit breakers for the Grand Coulee power plant. The contract price is $115,350. The Westinghouse Electric Co., Denver, was awarded a contract at $62,945 for 28 coupling capacitors and 16 line traps to be installed on the transmission lines between Shasta and Keswick power plants.

Small Business Aided In Surplus Acquisition

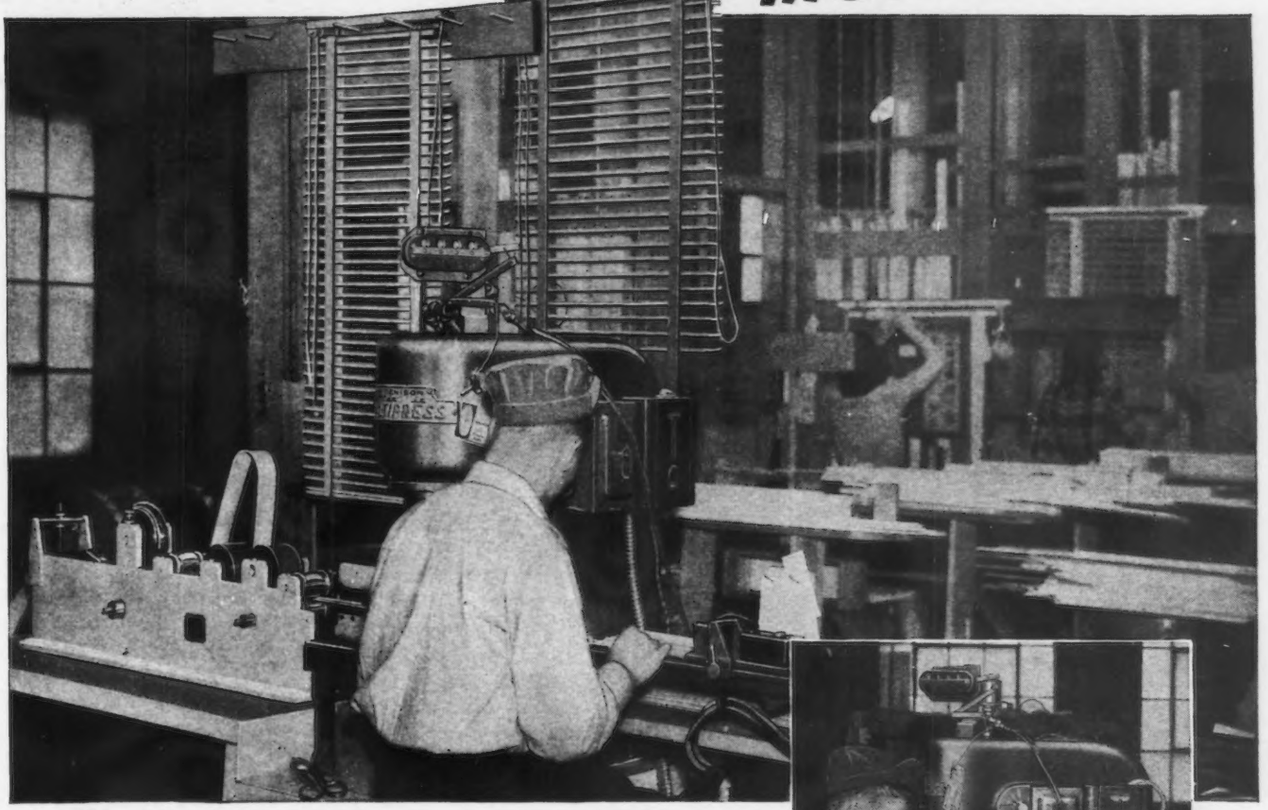
Washington

• • • **WAA has revised** Regulation 10 under the Surplus Property Act to aid small business in acquiring surplus industrial real property. The revised regulation grants to RFC, as successor to the Smaller War Plants Corp., an acquisition priority second only to that of federal agencies which desire the installation for their own use. The regulation, however, does not invalidate in any way options or rights of first refusals to the wartime lessee of the property.

Purchases made by RFC under this regulation will be paid for by the corporation, and will be contingent upon a certification that the purchase in question and subsequent resale is necessary to the promulgation of the competitive position of small business or will materially benefit RFC in its duties as the successor to the Smaller War Plants Corp. Immediately upon the signing of this regulation, the following priority sequence will go into effect: (1) Federal agencies; (2) RFC for resale to small business; (3) state and local governments; and (4) non-profit institutions.

The competitive position of priority holders was further enhanced by the signing of a revision of Reg. 5, which provides similar authority for the acquisition of surplus non-industrial real property by RFC for resale to small business.

Knocking the slats out of strip metal with MULTIPRESS



Another cost-cutting, production-boosting example of *MULTIPRESS* efficiency . . .

With a quick, automatic pressure stroke that's carefully preset to get best results *with minimum tool wear,* MULTIPRESS cuts venetian-blind slats to proper length with neatly rounded ends — and punches out eyelets for cords at the same time. It's just *one* of the tasks MULTIPRESS is doing for Yardley Industries, Columbus, Ohio — one of *hundreds* of different ways MULTIPRESS is cutting costs, increasing output, saving space, improving quality, reducing fatigue, slashing tooling costs and solving problems for industry generally!

Built in 4, 6, and 8-ton capacities, and featuring a wide choice of models with either manual or automatic-cycling controls, MULTIPRESS can provide any type of ram action required. In addition, a wide range of accessories and toolings, specially designed for the MULTIPRESS, extend its efficiency to an amazing variety of operations. Accessories include side shelves, extension tables, bolster plates, and cabinet-type benches. Tooling fixtures cover straightening, indexing, pelleting, and similar needs. And the remarkable new Vibratory Ram Action provides from 1 to 25 short, uniform, closely regulative strokes per ram cycle!

Features of the basic 4-ton unit give some idea of what MULTIPRESS offers. Its ram stroke is adjustable from 1/16-inch to six inches . . . downward pressures range from 300 pounds to 8000 pounds at 200 ipm . . . upward pressures range up to 5000 pounds . . . the unit measures only 16 x 26 x 34 inches, and weighs only 725 pounds!

Let us send you information on MULTIPRESS as applied to your specific needs. Write today!

The DENISON Engineering Co.

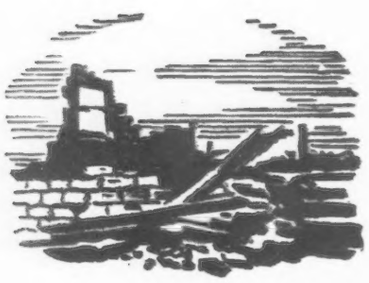
DENISON EQUIPMENT *in* APPLIED HydrOILics

1158 Dublin Rd., Columbus 16, O.

European Letter . . . .

JACK R. HIGHT

• Scottish industry worried about over-rationalization . . . Second thoughts evident on location of new works on Clyde River . . . Increased coal haulage imminent.



GLASGOW—Despite the timing of the publication of the British Iron & Steel Federation report, simultaneously with the decision to nationalize the British steel industry, steel executives here emphasize that the modernization plan was not planned as an argument against public ownership. Much of the modernization plan, particularly as it reflects the future of the Scottish steel industry, is a product of prewar planning, and may be subject to drastic revision before it actually comes to pass.

This revision seems most likely if the interim period until passage of nationalization legislation is passed. According to the Minister of Supply the legislation is apt to be 2 yr in process, and in this case the companies will be expected to proceed with the modernization. The viewpoint of the companies at the moment is that while the plan as presented offered the optimum for a privately-owned industry, some changes in outlook are dictated by the impending shift to government control.

Thus the major programs for the revision and modernization of the industry are being held in abeyance until the government details the precise position in regard to compensation for investments of private funds during the interim period. There is obvious difference of opinion and a considerable amount of political on this issue.

The Labor government made a deliberate show in the recent House debate of stating twice in specific terms that the industry would be repaid for all such investments. In fact the entire purpose in announcing the nationalization plan long before specific legislation was ready was to put the companies on safer ground, and to permit them to proceed with new plant programs without fear.

The simple assurance from the Chancellor of the Exchequer that they will be repaid is hardly sufficient detail to satisfy the chairman of a steel firm that heavy investments should be made. In the case of the largest Scottish producer there is a huge new steel melting shop in the federation plan to be located on a tide water site on the banks of the Clyde. As far as the government is concerned, the firm is assured that if it invests its cash reserves in such a plant the government will repay upon taking over the firm.

The only dark cloud on this sunset scene is the works that will be rendered obsolete by the erection of the new facility. The construction of a new works at an entirely new site is a long term investment. and commercially feasible only if considered as such. The company planned originally to get some continued service from the old mills. But they are afraid that while the government would be only too glad to pay for the new works, there would be no public enthusiasm for laying out the taxpayer's money for buying the obsolete mills.

My estimate would be that 80 pct of the steel plant construction and modernization work planned for Scotland is paralyzed at present by this dilemma. As far as the public is concerned, the members of Parliament are being told by the appropriate ministries that the basic issue is settled, and the fine points of application are under discussion.

BUT leaders in the industries here tell me that since John Wilmot made his speech in the Commons debate and departed on a Bermuda junket, they have not been approached by the government with any sort of proposal to clarify the compensation issue and make it possible to proceed with the work. I do not know whether I should imply from what I am told that only the government can take the initiative in such a matter. I fear that this relationship between the steel industry and its government is so new that the finer points of etiquette are not yet established. Naturally, neither party wants to commit the first faux pas.

The whole issue of investing any money for steel capacity in Scotland is so controversial that it is avoided whenever possible. The history of the industry here is typical of so many old sites. The first works were laid down about 20 miles southwest of Glasgow, in a valley rich with layers of ironstone and fine coking coal. The iron has long since been depleted, and for years the industry has depended on imported ores. A large percentage of scrap is also imported.

In more recent times the good coal seams are beginning to be worked out, and the movement is to new fields further to the east—somewhat nearer to the east coast of Scotland. There are factions far on one side of the argument which hold that under such conditions there is little excuse for maintaining the present scale of steel production in Scotland. The overall federation plan for the industry specifies that Scotland shall produce in future years almost exactly the same percent of the United Kingdom output as she does at present, but these pessimists hint that from sheer economic considerations the possibilities are better elsewhere.

But the Scots people are well organized in both the politics of the British Iron & Steel Federation and in the House of Commons, and guard their own interests jealously. Taking a ton of ingot capacity away from Scotland may prove as difficult as gagging Bilbo, whether desirable or not. Within the smokey confines of Glasgow itself there remain differences of opinion as to the most

When SHAFTS were shaped like this... "STANDARD'S" Double-Acting 10-ton Steam Hammer was a pace-maker

PHOTO COURTESY OF THE BETTMAN ARCHIVE

FROM A METAL MAKER'S "FAMILY ALBUM"

A steam-operated, all-metal hammer was still a bit of an innovation in 1874 . . . but not for Standard Steel. A ten-ton, double-acting model, imported from England, had already been turning out quality forgings for American industry for six years.

Standard's capacity has grown with demand . . . and today the forge shop has a yearly output of about 15,000 tons of locomotive forgings from the 14 steam hammers and lighter steam hydraulic presses, and 30,000 tons of heavier miscellaneous forgings from the heavier presses. All phases of the heating and mechanical working of ingots into forgings has been developed to a high degree of perfection, through careful and continuing study and research. These painstaking methods pay valuable dividends in service. When you need forgings, you'll find that an excellent way to simplify your buying is to "Standardize on Standard."

BLW THE BALDWIN GROUP

BALDWIN

FORGINGS AND CASTINGS

The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U.S.A. Offices: Philadelphia, New York, Chicago, St. Louis, Washington, Boston, San Francisco, Cleveland, Detroit, Pittsburgh, Houston, Birmingham, Norfolk.

"STANDARDIZE ON STANDARD" FOR YOUR FORGINGS AND CASTINGS

desirable location for a new major steelmaking plant. A vocal minority favor recognizing the trend in coal supply toward the east coast, and the consequent location of the plant on the North Sea side, in the Firth of Forth.

What appears to be the strongest viewpoint today favors increased haulage on coal. Probably the most important factor in this opinion is the location of a substantial home market concentrated within a few miles of Glasgow. The shipyards of the River Clyde and a large amount of heavy engineering industry in the locality direct the Scottish trade into heavy steel lines, and form the backbone of orders. If the new works is laid down closer to the coal fields, it will increase the freight on finished steel, shipped to the Glasgow area.

THE Scottish steel mills also plan to play an increasingly important part in the British steel export program, but it seems doubtful if there would be much preference on this score as far as sites are concerned. Adequate shipping facilities would be available from either side of the country.

While these debates are still going on among steel men locally, it is probable that they will be ironed out by the industry itself by the time the government gets the projects under way. In the same way, although there is some dissident opinion today as to the ultimate wisdom of the high degree of rationalization contemplated in the federation plan, all views will coincide by the time the work is ready to start. In contrast to common public debates on any such issue in America, the British federation frowns seriously on any airing of internal arguments in the press.

From an industry made up of scores of very small units some years ago, the Scottish steel production has been gradually concentrated through amalgamations until a single firm controls about 90 pct of the ingot capacity. Now there is to be an even further national concentration in specific product lines, and it is possible that this goes even beyond what the company itself had contemplated. It is all a matter of juggling over the conference table at Steel House in London, with one firm agreeing to drop from the sheet picture if another will give up their rail business, and vice versa.

All of the above factors bring up the eventual question of what must happen to the steel federation itself, after the public ownership becomes effective. Since its organization in the thirties it has been completely dominant in the steel business. Although there were companies and individuals who objected to the control of the federation, and some who fought it, they were all brought into line sooner or later.

Now, with the end in sight for both the individual companies and their association with the federation, will there be any noticeable lessening of the Steel House grip on all policies? While the industry remained in private hands there were many compelling reasons for an individual firm to modify its own ideas in favor of doing business as the Iron & Steel Federation dictated. With public ownership on the horizon to end the association, individual companies may take the opportunity in the interim to speak up more forcibly in favor of their own ideas.

Canadian Industry Expansion Projects Total $700 Million

Ottawa

• • • **C. D. Howe, Minister** of Reconstruction, announced that a survey undertaken jointly by his department and the Dominion Bureau of Statistics indicates that private industry in Canada, including public utilities, plans expenditures of $700 million on new construction and major improvements and on new machinery and equipment during 1946. The expenditures are: Manufacturing $400 million; mining, $25 million; telephones, $50 million; wood operations, $10 million; central electric stations, $75 million; transportation, (steam and electric railways, air, water and motor transport) $140 million.

Independent estimates of expenditures on durable goods covering the rest of private industry, which includes principally residents, institutions, commercial and agricultural groups, indicate an additional outlay of $500 million for the current year. This would bring the total investment to the private sector of the economy to $1.2 billion.

However, not all of these investment plans are likely to be realized this year. Although a number of industrial bottlenecks have been overcome, manpower and material shortages, particularly coal, steel and building materials, still hold back a full realization of these intentions of industry, business and consumers. Taking account of these factors, the Department of Reconstruction and Supply estimates that total private investment is not likely to exceed $1 billion. Nevertheless such a level of investment still would be some 20 pct above the 1945 level. This increase will compensate in part for the decline in public expenditures which followed the conclusion of the war.

Shortages Cut Work Week

Toronto

• • • **William Casey,** president of Canadian Locomotive Co., announced that the company will operate immediately on a 32-hr week basis, against the former rate of a 44-hr week.

Shortages of coal and steel resulting from the recent strikes in the United States and the Canadian Seamen's union strike made the reduction of hours unavoidable, Mr. Casey stated. The company is working on orders for the Belgian government, and has contracts to build locomotives for the French government and for the Canadian Pacific Rwy.

MacKenzie Gets New Post

Salt Lake City

• • • **A. G. MacKenzie,** manager of the Utah Metal Mine Operators' Assn., has been elected vice-president of the organization, a new position, and James K. Richardson, former secretary of the Tri-State Zinc & Lead Ore Producers Assn., of Picher, Okla., has been appointed manager. Mr. MacKenzie will continue to serve in an advisory capacity.

SIX FASTENINGS WHICH MUST SAVE TIME

—*every time they are used!*

Here are six standard fastenings which effect surprising results in speeding up assemblies—and all of them have set up production records for years past. Each one has a war record of its own—for saving time, when time was short. Each one of them now can be just as helpful in speeding up reconversion production. Just a little time saved, here and there, will determine who reaches the market first with a new product. And all six of these products have that one characteristic in common—*they save time.*

SEMS eliminate handling screw and washer separately. *That saves time.* Clutch Head screws reduce spoilage, drive straight the *first time.* Self-Tapping and Sheet Metal screws need no tapped holes—*drive fast* and hold tight. Lamson Lock Nuts of one-piece, all-metal design, make tight assemblies *stay tight.* Lamson Weather-tight bolts *need no counter-boring* in wood assemblies, set up faster, improve appearance. Lamson Dardelet Rivet-Bolts permit structural steel members to be fabricated and erected about *twice as fast* as can be done by any other means. All six of these products *are essentially time-savers*—and in reconversion—*time is money.*

There are few manufacturers who cannot use one or more of these six standard Lamson products with tangible advantages in cost reduction. Ask for complete information about all or any one of them.

THE LAMSON & SESSIONS COMPANY, 1971 W. 85th St., Cleveland 2, Ohio

Plants at Cleveland and Kent, Ohio; Chicago and Birmingham

HERE'S A COUPON FOR YOUR CONVENIENCE

THE LAMSON & SESSIONS COMPANY • 1971 West 85th Street • Cleveland 2, Ohio

Send information on ☐ Weather-tight Bolts ☐ Lamson Lock Nuts ☐ Lock-washer Screws ☐ Thrd. Forming Screws ☐ Dardelet Rivet-Bolts ☐ Clutch Head Screws

Name _____ Title or Kind of Work

Company

Street Address

City, Zone and State

TS AND NUTS · LAG SCREWS · SEMS · LOCK NUTS · CAP SCREWS · COTTERS · SET SCREWS · DARDELET RIVET BOLTS · KEY BOLTS

LAMSON & SESSIONS

Ask your Jobber for the Lamson Line

· WEATHER-TIGHT BOLTS · MACHINE SCREWS AND NUTS · SPECIALS

PERSONALS

° ° °

• **Wayne Rawley, Jr.,** who has been a member of the purchasing dept. of the Blaw-Knox Div. of the Blaw-Knox Co., Pittsburgh, for the past 12 yr, has been promoted to division purchasing agent. Mr. Rawley joined Blaw-Knox in 1928. He succeeds J. E. McWilliams, who has recently been promoted to general purchasing agent.

• **J. M. Fenner** has been appointed division superintendent, stainless steel, at the Waukegan, Ill. works of American Steel & Wire Co. **Ronald E. Griffiths** succeeds him as supervisor of the research laboratory in Cleveland.

• **R. W. Price,** who has been representing Norton Co., Worcester, Mass., in the Connecticut area for many years, has been appointed district manager of that area by the Abrasive Div. of Norton Co. **C. B. Price, Jr.,** recently returned from Naval service, has been appointed abrasive engineer and will largely take over Mr. Price's former territory in the northern half of the state.

• **Harry W. Barkley,** formerly executive vice-president and general manager of the National Tool Co., Cleveland, has been elected president of the company.

HARRY W. BARKLEY, president, National Tool Co.

• **Sam R. Clement,** assistant general branch manager of the Birmingham sales district, has been promoted to assistant general manager of sales, Phosphate Div. of the Monsanto Chemical Co., St. Louis. He was formerly associated with the Swann Chemical Co. from 1931 to 1935, when the company was acquired by Monsanto.

• **Robert D. Becker** has been appointed manager, Furniture Div. of the Reynolds Metals Co., Louisville, Ky. Prior to coming with Reynolds Metals, Mr. Becker was associated with the Stewart Dry Goods Co. During the past 5 yr he has served in varying capacities in both Foil and Parts Divs. of Reynolds Metals.

CARL WADSWORTH, district traffic manager, Bethlehem Pacific Coast Steel Corp.

• **Carl Wadsworth** has been appointed district traffic manager for Bethlehem Pacific Coast Steel Corp.'s southern California operations with headquarters at the Vernon, Calif. plant. Mr. Wadsworth began his traffic work with the Ford Motor Co. in 1935.

• **J. F. Brooker** has been appointed assistant superintendent of the forge dept. at the Canton, Ohio plant of Barium Steel & Forge, Inc. He was formerly night superintendent of the Johnston & Jennings Co. plant in Cleveland. Mr. Brooker will also be in charge of the hammer shop, in addition to his duties as assistant superintendent of the forge dept.

DAVID M. KLAUSMEYER, president, Marmon-Herrington Co., Inc.

• **Bert Dingley** has retired as president of the Marmon-Herrington Co., Inc., Indianapolis. He is succeeded by **David M. Klausmeyer,** who has resigned as plant manager of Chevrolet Commercial Body Div. of General Motors Corp. to join the Marmon-Herrington organization.

• **John W. Porter,** president of the Alabama By-Products Corp., Birmingham, has retired from active business and **Phil H. Neal,** assistant to the president, has been made president. Mr. Porter became director of the Alabama By-Products Corp. in 1932, and its president in 1935. He also was president of the ABC Coal & Coke Co. and Smokeless Fuel Co., subsidiary companies. Mr. Neal has been associated with the corporation since its formation in 1920. For many years manager of the coke and by-products sales, he became vice-president of Alabama By-Products in 1945 and was promoted to assistant to the president later that year.

• **Clyde E. Cochran** has retired as director of engineering of Elwell-Parker Electric Co., Cleveland, and has been succeeded by **Dwight Hanchette,** associated with him at Elwell-Parker for many years. Mr. Cochran has been with the company continuously for 44 yr. He was made chief engineer in 1928 and director of engineering in 1943.

CARL W. COSLOW, vice-president in charge of manufacturing, Plomb Tool Co.

• **Carl W. Coslow,** formerly works manager for the Plomb Tool Co., Los Angeles, has been promoted to vice-president in charge of manufacturing. Mr. Coslow, from 1925 to 1930, was general superintendent for the American Cyanamide Co. Leaving Cyanamide, he established himself as a Nash distributor, remaining there until he joined the Hamilton Watch Co. in 1935. In 1942, he joined Consolidated-Vultee Aircraft Corp. and became division manager at Vultee Field. He joined Plomb Tool Co. in 1945.

• **J. W. Weingartner** has been made production control manager of the Brown Instrument Co., Philadelphia. Mr. Weingartner has been with this division of Minneapolis-Honeywell Regulator Co. for the past 22 yr. He will also direct purchasing. **Charles Goodman** has taken over the duties of purchasing agent under Mr. Weingartner's supervision and **William Lawson** has been named assistant production control manager.

• **Theodore W. Robinson, Jr.** has been elected chairman of Ditto, Inc., Chicago. **Theodore W. Robinson** has been elected vice-chairman; **Kenneth M. Henderson,** president and treasurer; **Sanger P. Robinson,** vice-president; **H. Stuart Stone, Jr.,** vice-president; and **B. Miller Wright, Jr.,** secretary.

• **Albert W. Lohn** has been promoted to vice-president of Ducommun Metals & Supply Co., Los Angeles. He will continue to serve as general manager of the company, a position he has held for the past 7 yr.

• **Carlos F. Noyes,** retired former comptroller of the Baldwin Locomotive Works, Philadelphia, has been elected a member of the board and of the executive committee.

• **George K. Dreher,** vice-president in charge of manufacturing of Ampco Metal, Inc., Milwaukee, has resigned to become vice-president and general manager of the Rogers Pattern & Foundry Co., Los Angeles.

WILLIAM E. KNOX, president and general manager, Westinghouse Electric International Co.

• **William E. Knox** has been elected president and general manager of the Westinghouse Electric International Co., New York. He first served as a sales clerk with the company 24 yr ago, and succeeds **John W. White,** who has resigned to become director general of Industria Electrica de Mexico. Mr. Knox has been vice-president of the International Co. since 1944, and before that was assistant general manager of the company since 1937. Mr. White joined the parent Westinghouse Co. at its Pittsburgh headquarters 41 yr ago, becoming affiliated with the Westinghouse Electric International Co. in 1918.

• **Harold W. Morgan** has been appointed manager of the Birmingham plant of Virginia Bridge Co. succeeding **Herbert A. Davies,** who has been promoted to the position of vice-president and general manager of the company. Mr. Morgan was previously assigned to the operating dept. as assistant to the manager of the Birmingham plant.

• **John C. Morris** has been appointed superintendent of manufacturing of the Resin and Insulation Materials Divs. of the General Electric Co.'s chemical dept., Pittsfield, Mass. Mr. Morris has been assistant superintendent for the past year, and has been associated with GE for 18 yr.

• **Roy L. Salter** has been appointed vice-president of the Southern Wheel Div. of the American Brake Shoe Co., New York. He first joined the Southern Wheel Div. in 1924 as assistant foreman of the Savannah, Ga. plant and since then has worked in a supervisory capacity at Wheel plants in Portsmouth, Va., and Sayre, Pa. He took leave of absence between 1937 and 1942 to serve with the Assn. of Manufacturers of Chilled Tread Car Wheels. He returned to Southern Wheel to take up the position of general superintendent and was made works manager of the division in 1944.

ROY L. SALTER, vice-president, Southern Wheel Div., American Brake Shoe Co.

R. A. FISCHER, manager, purchasing dept., International Harvester Co.

• **R. A. Fischer** has been appointed manager of the purchasing dept. of the International Harvester Co., Chicago. Mr. Fischer started his association with the company in 1923. He succeeds **R. M. McCulloch** who has retired after 42 yr of service with the organization.

• **Ambrose J. Seitz** has been elected vice-president in charge of traffic for the Union Pacific Railroad. He joined Union Pacific in 1919 as confidential clerk to the vice-president of traffic.

AUSTIN J. PADDOCK, whose appointment as operating vice-president of American Bridge Co. was announced in the July 4 issue.

• **Thomas Lord,** vice president of Lord Mfg. Co., Erie, Pa., has been elected president of the company to succeed **H. C. Lord,** who becomes chairman of the board.

• **A. M. MacCutcheon,** senior vice-president, Reliance Electric & Engineering Co., Cleveland, has retired as an officer and director.

• **Henry Strobel, Jr.** has been appointed Cincinnati district representative of the Hammond Iron Works, Warren, Pa.

• **H. K. Babbitt,** production manager of the special products section of the E. I. du Pont de Nemours & Co.'s explosives dept., has retired.

• **Donald P. Else,** general auditor of Nash-Kelvinator Corp., Detroit, has been elected assistant comptroller of the company. Mr. Else joined the company in 1928 in the Accounting Div. and was appointed auditor in 1937. He succeeds **E. J. McMahon,** who recently resigned to become vice-president of A. M. Richards & Co., Detroit.

• **Charles E. Gibson,** for the past 18 yr chief clerk in the claim dept., Republic Steel Corp., has been appointed assistant manager of the department, succeeding the late **T. C. Dougherty.**

• **William T. Birney** has retired as director of sales of the Winchester Repeating Arms Co., Western Cartridge Co., and Bond Electric Corp., divisions of Olin Industries, Inc., New Haven, Conn.

• **Robert S. Smiley** has been named assistant manager of the Automotive Products Div. of Goodyear Tire & Rubber Co., Akron, Ohio. Mr. Smiley joined the Goodyear Co. in 1928 and has been in charge of mechanical goods sales at their plant in St. Marys, Ohio.

• **Thomas J. Watson, Jr.** has been elected a vice-president of the International Business Machines Corp., New York. He was previously assistant to the executive vice-president. Mr. Watson joined IBM in 1937, entered military service in 1940 and returned to IBM on Jan. 1, 1946. He became assistant to the executive vice-president later in the same month.

MARSHALL M. SMITH, vice-president and director, E. W. Bliss Co.

• **Marshall M. Smith** has been elected vice-president and director of the E. W. Bliss Co., Brooklyn. He has been associated with the company since 1945 as director of foreign operations, and recently was made assistant general sales manager. Prior to his association with the E. W. Bliss Co., Mr. Smith was with the Worthington Pump Co. for 19 yr.

OBITUARY...

• **Arthur W. Joerg, Sr.,** foundry superintendent of the Bond plant of American Radiator and Standard Sanitary Corp., Pittsburgh, for the last 15 yr, died June 29 at his home in North Tonawanda, N. Y.

• **William C. McKeown,** 80, president of the McKeown Engineering Co., died June 23 in Buffalo after a long illness.

• **Albert B. Leavy,** 52, tool representative of the Curtiss-Wright Corp., died recently at his home in Buffalo.

• **Etienne M. Roubieu,** vice-president and chief engineer of the Tropenas Co. at the Rio de Janeiro, Brazil office, died recently.

• **Casper P. Farlow,** field engineer for the Westinghouse Electric Corp., died recently in Detroit.

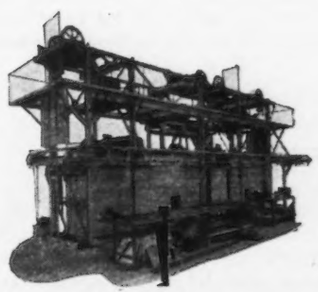
This morning the advertising department caught hell!

This is no joke, son. We don't know how it happened—but our vice-president heard of a heat treating superintendent who didn't know Lindberg made **big** special heat treating furnaces.

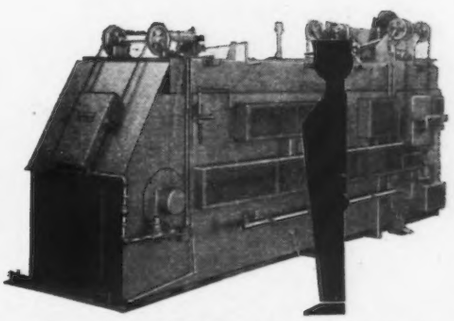
This fellow knew that we'd built thousands of standard Cyclone tempering furnaces and Hydryzing furnaces—and he knew that we'd turned out a lot of brazing furnaces, too. But he didn't know that Lindberg made big special furnaces—conveyors, rotary hearth jobs, and car bottom furnaces.

So the vice-president (he's in charge of sales) really let go at the Advertising Department. This is a cleaned-up version of what he said—"Here the Sales department almost covers the country with these big installations, and you guys in the Advertising Department keep it a secret. How about maybe mentioning in *just one* of your ads that for years we've been selling these big jobs, etc. etc. etc."

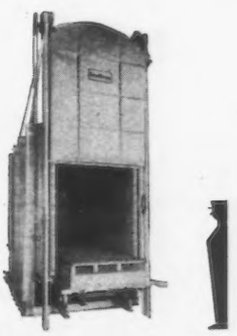
Well, we had to do something to keep the guy quiet—he *does* sign our pay checks, you know. So will you take a quick look at these pictures—and by all means read the captions.



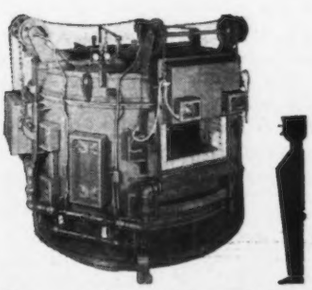
Special Gun-Barrel Furnace—automatically normalizes, hardens, and tempers 2,385 gun barrels every 24 hours.



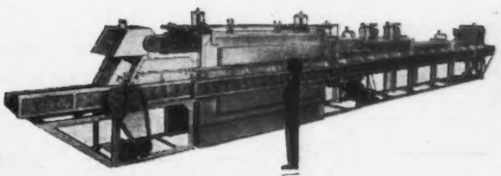
Conveyor Hydryzing Furnace—for production hardening of nuts, bolts, springs, wrenches, etc.



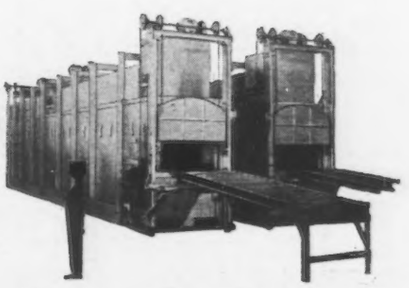
Car Bottom Tempering Furnace—for production tempering and stress relieving of large castings and welded structures.



Rotary Hearth Hydryzing Furnace—for production hardening that requires hand quenching.



Roller Hearth Brazing Furnace—for production brazing of heavy work such as engine blocks and gears.



Chain Conveyor Furnaces—for production heat treatment of aluminum aircraft parts.

LINDBERG ENGINEERING CO., 2452 W. Hubbard St., Chicago 12, Illinois

LINDBERG FURNACES

Dear Editor:

STAINLESS FOR HYDROCHLORIC

Sir:

We are interested in steels and especially in stainless steels and at present are looking for a certain quality of stainless which would be suitable for hydrochloric acid . . . you may be aware of American manufacturers who are makers of stainless steels suitable for the above acid and we would appreciate it if you would give us the names of some manufacturers in the United States whom we could approach on this subject.

MERREM & LA PORTE N.V.
Amsterdam
The Netherlands

● Stainless steel makers' engineers generally do not recommend any of the present production grades for service in hydrochloric acid. Materials available for this service appear to be limited to monel or Hastalloy. We suggest you address your specific problem to International Nickel Co., 67 Wall St., New York (monel), and to Haynes Stellite Co., Kokomo, Ind. (Hastalloy).—Ed.

PIG IRON PRICES

Sir:

We are interested in obtaining the average prices of pig iron for the years 1943-44-45. If your office has these compiled and you can furnish them to us, it will be sincerely appreciated.

J. R. PINKSTON
Vice-President
First State Bank of Albany
Albany, Ga.

● Our composite pig iron price during 1942-43-44 reflected the OPA ceiling of $23.61. In 1945 the price was increased during February to $24.61 and in October increased again to $25.37. The average for the year 1945 was $24.61.—Ed.

MEASURING THREADS

Sir:

I would appreciate your mailing to me at your convenience a reprint of an article entitled "Three-Wire Thread Gaging Simplified" which appeared in the Apr. 18 issue.

C. L. BROTHERTON
Inspection Dept.
Caterpillar Tractor Co.
San Leandro, Calif.

● Tear sheets have been mailed.—Ed.

PRECISION CASTING

Sir:

Enclosed find check for $1 for another copy of your "Precision Casting —Lost Wax Process."

D. WILKIE
Foundry Superintendent
Beryllium Corp.,
Reading, Pa.

WHERE IS THE TIN?

Sir:

We from time to time ran a small ad concerning hot dip tinning equipment in your publication, prior to the war. After the Japs got control of the tin we stopped and many articles appeared regarding what the tin situation was going to affect us. Our government spent millions to help this situation in various peculiar ways. But no tin.

The war has been over for some time—who has the tin now that the Japs took? Tin plate is scarcer than ever and very little tin is available to tin users. I have been told our dear allies now control it. What became of the big plant for reducing tin ores in Texas?

M. A. ROLLMAN
M. A. Rollman Associates
Landisville, Pa.

EUROPEAN LETTER

Sir:

I would like to get another copy of the May 23 issue. I really only want "European Letter" by Jack R. Hight, which appears on pp. 82 and 84, so these sheets could be mailed to me without sending the entire issue.

A. MacFADYEN
Vice-president & General Manager
Page-Hersey Tubes, Ltd.
Toronto, Canada

● Tear sheets of the "European Letter" are on the way.—Ed.

WELDING RODS IN GERMANY

Sir:

Will you please send me a reprint of the article "German Welding Rod Manufacture" by Clarence G. Merritt, which appeared in the June 6 issue.

W. B. ANDERSON
Titanium Pigment Corp.
New York 6

● Reprints of this article have not been made; however, tear sheets are being forwarded.—Ed.

DIAMOND TOOLS

Sir:

Please send tear sheets of the article "Selection and Use of Diamond Tools," written by Edward L. Murray for the Sept. 6, 1945 issue. There may have been other articles in issues printed just prior or just after this issue; please forward them if they are available.

A. RICH
Advertising Dept.
J. K. Smit & Sons, Inc.
New York 7

● Copies of the two-part article have been mailed.—Ed.

CASTING SALVAGE

Sir:

I have read with great interest the article in the Feb. 28 issue covering the possibility of salvaging castings by the dot welding method. It is my understanding that this equipment is announced by the Metallizing Co. of America, address unknown. We would appreciate any additional information available on this subject.

W. H. HELBER
Electric Steel Foundry Co.,
Portland, Ore.

● The company's address was inadvertently omitted from the article. Full details of the process can be obtained by writing the Metallizing Co. of America, 1318 West Congress St., Chicago.—Ed.

TOOL STEEL DIRECTORY

Sir:

Kindly send me two copies of your booklet entitled "Directory of Tool Steels."

N. B. TOMPKINS
Crucible Steel Co. of America
Baltimore 2

Sir:

Please send us 12 of your "Directory of Tool Steels" booklets . . .

F. E. ALLISON
Latrobe Electric Steel Co.
Detroit 11

● The new and revised edition of THE IRON AGE "Directory of Tool Steels," which covers tool, metal-cutting and die steels and sintered carbides, is available to readers at the following prices: $1 for a single copy, $1.50 for two copies, $2 for three copies, and 50¢ each for five or more copies.—Ed.

ELEPHANT AND PISMIRE

Sir:

Congratulations! That editorial on p. 37 of the May 16 issue is certainly pertinent and timely; we read it with a great deal of appreciation. Is it possible for us to obtain reprints of the article? We could use about 20 copies.

M. R. ANSTICE, JR.
Secretary-Treasurer
Anstice Co., Inc.
Rochester 9

● Due to the heavy demand for Mr. Van Deventer's editorial "The Elephant and the Pismire," we have reprinted it and are glad to furnish you with the number of copies requested with our compliments.—Ed.

BRAILLE INSTRUMENTS

Sir:

We would appreciate your sending us two copies of "Braille Instruments Aid Blind Inspectors," pp. 56 and 57 of the May 23 edition of THE IRON AGE.

J. F. CARMODY
Engineering Standards
International Business Machines Corp.
Endicott, N. Y.

wheelabrator

A NIAGARA of CLEANING POWER!

Perfectly controlled to give you faster, more economical cleaning production

Speed cleaning at low cost results from the flood of abrasive that pours in a constant torrent from the spinning wheel of an Airless Wheelabrator . . . impacts from more than a quarter-million particles of abrasive per second or 300 pounds of abrasive per minute.

In terms of airblasting it would take approximately five 3/8" nozzles operating under an air pressure of 90# P. S. I. and utilizing up to 225 H. P. to equal the foregoing accomplishment of a standard Wheelabrator requiring only 15 H. P.

The blast stream of the Wheelabrator is under perfect control and the full impact of its power is uniformly concentrated upon the job, scouring sand and scale from every pocket, recess, and fissure. Unlike airblasting there are no variations in pressure, velocity or abrasive volume to alter cleaning efficiency and production speeds. Wheelabrating can be timed practically to the second.

Savings result from reduced costs of labor, power, space, machining and grinding, cutting tools, inspection, etc., as reflected in the following statements of users:

WHEELABRATOR SAVINGS TOLD BY USERS*

"Reduced cleaning time approximately 50%."	(Malleable Foundry)
"Reduced direct labor costs 50%."	(Automotive Mfr.)
"Saved 300 cubic feet of air per minute."	(Malleable Foundry)
"5 hours' cleaning time reduced to 15 minutes."	(Michigan Mfr.)
"Our electric bills have been cut almost in half."	(Gray Iron Foundry)
"Cleaning now with four less operators."	(Gray Iron Foundry)
"Time cut from 24 hours to 8 hours."	(A Connecticut Steel Foundry)
"Decided increase in tool life between grinds."	(Prominent Tool Mfr.)
"Replaced 14 tumblers, saving considerable space."	(Canadian Mfr.)
"18 hours' cleaning time reduced to 3 hours."	(Brass Foundry)
"Machinability much improved over tumbled castings."	(Gray Iron Foundry)

* Names of users supplied upon request.

WHEELABRATOR

TUMBLASTS

Tumblasts are made in eight sizes, having capacities of 1 to 63 cu. ft. for handling loads ranging from less than a hundred pounds to several tons, and for cleaning individual parts weighing from a fraction of an ounce up to hundreds of pounds each.

TABLES

Tables are used for cleaning flat or fragile work that is not adapted to tumbling. Built in three types: The *Multi-Table* is recommended for work having high vertical edges or intricate recesses and cavities. The *Plain Table* is especially suitable for work having few pockets and vertical edges, such as furnace castings. The *Swing Table* is an ideal general purpose machine for handling a wide range of large and small pieces.

SPECIAL CABINETS

Cabinets are specially designed and engineered for handling work where special production problems prevail or where the work, due to size, shape or weight, cannot be adapted to a standard machine.

American
FOUNDRY EQUIPMENT CO.
510 SOUTH BYRKIT STREET, MISHAWAKA, IND.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

Dear Editor:

STAINLESS FOR HYDROCHLORIC

Sir:

We are interested in steels and especially in stainless steels and at present are looking for a certain quality of stainless which would be suitable for hydrochloric acid . . . you may be aware of American manufacturers who are makers of stainless steels suitable for the above acid and we would appreciate it if you would give us the names of some manufacturers in the United States whom we could approach on this subject.

MERREM & LA PORTE N.V.
Amsterdam
The Netherlands

● Stainless steel makers' engineers generally do not recommend any of the present production grades for service in hydrochloric acid. Materials available for this service appear to be limited to monel or Hastalloy. We suggest you address your specific problem to International Nickel Co., 67 Wall St., New York (monel), and to Haynes Stellite Co., Kokomo, Ind. (Hastalloy).—Ed.

PIG IRON PRICES

Sir:

We are interested in obtaining the average prices of pig iron for the years 1943-44-45. If your office has these compiled and you can furnish them to us, it will be sincerely appreciated.

J. R. PINKSTON
Vice-President
First State Bank of Albany
Albany, Ga.

● Our composite pig iron price during 1942-43-44 reflected the OPA ceiling of $23.61. In 1945 the price was increased during February to $24.61 and in October increased again to $25.37. The average for the year 1945 was $24.61.—Ed.

MEASURING THREADS

Sir:

I would appreciate your mailing to me at your convenience a reprint of an article entitled "Three-Wire Thread Gaging Simplified" which appeared in the Apr. 18 issue.

C. L. BROTHERTON
Inspection Dept.
Caterpillar Tractor Co.
San Leandro, Calif.

● Tear sheets have been mailed.—Ed.

PRECISION CASTING

Sir:

Enclosed find check for $1 for another copy of your "Precision Casting —Lost Wax Process."

D. WILKIE
Foundry Superintendent
Beryllium Corp.,
Reading, Pa.

WHERE IS THE TIN?

Sir:

We from time to time ran a small ad concerning hot dip tinning equipment in your publication, prior to the war. After the Japs got control of the tin we stopped and many articles appeared regarding what the tin situation was going to affect us. Our government spent millions to help this situation in various peculiar ways. But no tin.

The war has been over for some time—who has the tin now that the Japs took? Tin plate is scarcer than ever and very little tin is available to tin users. I have been told our dear allies now control it. What became of the big plant for reducing tin ores in Texas?

M. A. ROLLMAN
M. A. Rollman Associates
Landisville, Pa.

EUROPEAN LETTER

Sir:

I would like to get another copy of the May 23 issue. I really only want "European Letter" by Jack R. Hight, which appears on pp. 82 and 84, so these sheets could be mailed to me without sending the entire issue.

A. MacFADYEN
Vice-president & General Manager
Page-Hersey Tubes, Ltd.
Toronto, Canada

● Tear sheets of the "European Letter" are on the way.—Ed.

WELDING RODS IN GERMANY

Sir:

Will you please send me a reprint of the article "German Welding Rod Manufacture" by Clarence G. Merritt, which appeared in the June 6 issue.

W. B. ANDERSON
Titanium Pigment Corp.
New York 6

● Reprints of this article have not been made; however, tear sheets are being forwarded.—Ed.

DIAMOND TOOLS

Sir:

Please send tear sheets of the article "Selection and Use of Diamond Tools," written by Edward L. Murray for the Sept. 6, 1945 issue. There may have been other articles in issues printed just prior or just after this issue; please forward them if they are available.

A. RICH
Advertising Dept.
J. K. Smit & Sons, Inc.
New York 7

● Copies of the two-part article have been mailed.—Ed.

CASTING SALVAGE

Sir:

I have read with great interest the article in the Feb. 28 issue covering the possibility of salvaging castings by the dot welding method. It is my understanding that this equipment is announced by the Metallizing Co. of America, address unknown. We would appreciate any additional information available on this subject.

W. H. HELBER
Electric Steel Foundry Co.,
Portland, Ore.

● The company's address was inadvertently omitted from the article. Full details of the process can be obtained by writing the Metallizing Co. of America, 1318 West Congress St., Chicago.—Ed.

TOOL STEEL DIRECTORY

Sir:

Kindly send me two copies of your booklet entitled "Directory of Tool Steels."

N. B. TOMPKINS
Crucible Steel Co. of America
Baltimore 2

Sir:

Please send us 12 of your "Directory of Tool Steels" booklets . . .

F. E. ALLISON
Latrobe Electric Steel Co.
Detroit 11

● The new and revised edition of THE IRON AGE "Directory of Tool Steels," which covers tool, metal-cutting and die steels and sintered carbides, is available to readers at the following prices: $1 for a single copy, $1.50 for two copies, $2 for three copies, and 50¢ each for five or more copies.—Ed.

ELEPHANT AND PISMIRE

Sir:

Congratulations! That editorial on p. 37 of the May 16 issue is certainly pertinent and timely; we read it with a great deal of appreciation. Is it possible for us to obtain reprints of the article? We could use about 20 copies.

M. R. ANSTICE, JR.
Secretary-Treasurer
Anstice Co., Inc.
Rochester 9

● Due to the heavy demand for Mr. Van Deventer's editorial "The Elephant and the Pismire," we have reprinted it and are glad to furnish you with the number of copies requested with our compliments.—Ed.

BRAILLE INSTRUMENTS

Sir:

We would appreciate your sending us two copies of "Braille Instruments Aid Blind Inspectors," pp. 56 and 57 of the May 23 edition of THE IRON AGE.

J. F. CARMODY
Engineering Standards
International Business Machines Corp.
Endicott, N. Y.

wheelabrator

A NIAGARA of CLEANING POWER!

Perfectly controlled to give you faster, more economical cleaning production

Speed cleaning at low cost results from the flood of abrasive that pours in a constant torrent from the spinning wheel of an Airless Wheelabrator . . . impacts from more than a quarter-million particles of abrasive per second or 300 pounds of abrasive per minute.

In terms of airblasting it would take approximately five ⅜" nozzles operating under an air pressure of 90# P. S. I. and utilizing up to 225 H. P. to equal the foregoing accomplishment of a standard Wheelabrator requiring only 15 H. P.

The blast stream of the Wheelabrator is under perfect control and the full impact of its power is uniformly concentrated upon the job, scouring sand and scale from every pocket, recess, and fissure. Unlike airblasting there are no variations in pressure, velocity or abrasive volume to alter cleaning efficiency and production speeds. Wheelabrating can be timed practically to the second.

Savings result from reduced costs of labor, power, space, machining and grinding, cutting tools, inspection, etc., as reflected in the following statements of users:

WHEELABRATOR SAVINGS TOLD BY USERS*

"Reduced cleaning time approximately 50%."	(Malleable Foundry)
"Reduced direct labor costs 50%."	(Automotive Mfr.)
"Saved 300 cubic feet of air per minute."	(Malleable Foundry)
"5 hours' cleaning time reduced to 15 minutes."	(Michigan Mfr.)
"Our electric bills have been cut almost in half."	(Gray Iron Foundry)
"Cleaning now with four less operators."	(Gray Iron Foundry)
"Time cut from 24 hours to 8 hours."	(A Connecticut Steel Foundry)
"Decided increase in tool life between grinds."	(Prominent Tool Mfr.)
"Replaced 14 tumblers, saving considerable space."	(Canadian Mfr.)
"18 hours' cleaning time reduced to 3 hours."	(Brass Foundry)
"Machinability much improved over tumbled castings."	(Gray Iron Foundry)

* Names of users supplied upon request.

WHEELABRATOR

TUMBLASTS

Tumblasts are made in eight sizes, having capacities of 1 to 63 cu. ft. for handling loads ranging from less than a hundred pounds to several tons, and for cleaning individual parts weighing from a fraction of an ounce up to hundreds of pounds each.

TABLES

Tables are used for cleaning flat or fragile work that is not adapted to tumbling. Built in three types: The *Multi-Table* is recommended for work having high vertical edges or intricate recesses and cavities. The *Plain Table* is especially suitable for work having few pockets and vertical edges, such as furnace castings. The *Swing Table* is an ideal general purpose machine for handling a wide range of large and small pieces.

SPECIAL CABINETS

Cabinets are specially designed and engineered for handling work where special production problems prevail or where the work, due to size, shape or weight, cannot be adapted to a standard machine.

American
FOUNDRY EQUIPMENT CO.
510 SOUTH BYRKIT STREET, MISHAWAKA, IND.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

This Industrial Week . . .

- **Basic Raw Materials in Tight Supply**
- **Scrap Looms as Most Serious Product**
- **Steel Ingot Rate Advances to 88.5 Pct**

TIGHTNESS in the supply of scrap, pig iron and coke, basic products in steelmaking, has temporarily blocked any sustained thinking on the matter of steel price increases. While most steel firms have their ears cocked towards the price debate in Congress and their eyes glued to news dispatches looking for the trend which the price control question will take, there is practically no chance of any major steel price changes in the immediate future.

When the air is cleared and it becomes definite whether OPA price controls will be resurrected or whether the OPA will have a decent burial, then steel firms will begin to take serious action on straightening out the unbalanced price structure under which many steel products are not carrying their economic responsibilities. On the other hand it is almost certain that no general across-the-board advance in steel prices will be made until the latter part of this year if all price controls are permanently eliminated.

Scrap shipments in many localities have declined to as much as 50 pct below wartime movement and the situation in some spots is critical. Some steel firms in one locality are making long distance shipments from scrap inventories to other plants of the same company in order to maintain operations there. Furthermore, scrap consumers are not now building up inventories for next winter—a general practice among steel firms during the summer months.

THE steel industry and the scrap industry through their respective institutes engaged this week in a mild debate as to who was responsible for the present dearth of scrap. The accusation by an American Iron & Steel Institute official that some brokers and dealers were holding back scrap because higher prices might soon be effective was answered by the Institute of Scrap Iron & Steel which pointed out that the lack of small dealers who were a wartime casualty and the unrealistic attitude of the OPA in handling the scrap situation coupled with strikes at steel consumer plants were the major reasons for the present situation.

This public argument between the two groups is not a new story since the same general exchanges took place several times during the war. Steel producers have been insisting that new contracts on scrap should be written at the old OPA ceiling price while many scrap brokers have insisted that new contracts should carry a retroactive feature. The amount of scrap being held back because of the price confusion is probably not a very large share of the total scrap stock. Many brokers, while not obtaining a retroactive clause from steelmakers, have nevertheless agreed with their suppliers, the dealers, to accept such a clause.

More basic than these surface arguments over the scrap supply situation are the facts that: First, large reservoirs of scrap accumulated over the past decade were used up in the war effort; second, manufacturing concerns which furnish scrap as a byproduct have not attained full reconversion production levels; third, thousands of small dealers known as "scrappies" or "junkies" have left the scrap collection business for better paying jobs; fourth, war supplies sent abroad represented a definite loss in return scrap; and fifth, the confusion surrounding free markets which have not existed for several years is no different in the scrap and steel trades than it is in other industries.

DESPITE the shortage of scrap and some temporary labor difficulties, the steel industry this week was operating at 88.5 pct of rated capacity, up ½ point from last week's revised rate of 88 pct. The revision in last week's rate, which was originally estimated at 89 pct of capacity, was occasioned by a strike in the Buffalo district which substantially reduced operations there.

Steel consumers scanning the steel ingot rate are apt to wonder why supplies are not reaching them at a faster pace. Finished steel products from the ingot constitute about 70 pct of actual production, the balance being discarded and used for openhearth scrap. Furthermore about 12 to 18 pct of the semifinished steel made goes to nonintegrated mills which then turn it into finished steel products. About 10 pct goes to warehouses and some companies ship steel to affiliated firms. While the ingot rate has and is a good indication of steel activity, there is a time-lag before the finished steel items reach consumers.

SINCE OPA was eliminated only one increase in prices has occurred in the iron and steel industry. A southern pig iron producer has raised the price of pig iron $3 a ton, while another southern maker upped his price $4 a ton, but the latter advance was approved by OPA before June 30. Still another iron producer continues to sell pig iron at the old OPA ceiling price and no price action has been taken as yet by northern pig iron producers. Because of the increase in the South, THE IRON AGE composite price for pig iron has advanced this week from $26.12 a gross ton to $26.45 a ton.

Merchant iron is extremely short because producers have increased their hot metal charge for steel production. Because of this and the fact that foundries are continuing to demand large supplies of iron, the high rate of pig iron output has been pinched by the lack of adequate coke supplies. Coke is expected to remain in tight supply for some time as additional blast furnaces are blown in by steel companies to make up for the lack of iron and steel scrap.

• **PIG IRON OUTLOOK**—Pig iron scarcities at foundries are emphasized by the scrap shortage. Whereas mill melts normally are high in scrap, it has been necessary to boost hot metal charges and thus reduce the merchant iron availability.

• **LOCOMOTIVE ORDER**—Chesapeake & Ohio Railway Co. has placed orders for 40 new, high-speed, heavy-duty freight locomotives, to cost approximately $9,000,000. American Locomotive Co., Schenectady, will build 30 of the new locomotives and Lima Locomotive Works, Lima, Ohio, will build the other ten. They will be of the 2-8-4 type and K-4 classification. Delivery is expected to start in the fourth quarter of 1946.

• **SCRAP PRICES VULNERABLE**—Persistent scrap offerings for immediate delivery with future price negotiation are being met with consumer refusals insofar as steel companies are concerned. However, when it comes to shutting down openhearth furnaces because of scrap shortages, there is no question that mills will meet the insinuated higher price demand. On the other hand, production scrap should be coming out in greater volume within three weeks, so as to ease the present critical situation.

• **COKE SUPPLIES SHORT**—Coke, like scrap and iron, is in extremely short supply, actually reducing iron output of some steel companies. One blast furnace operator, with a normally high coking capacity, was recently in search of outside coke supplies that could be purchased. Likewise, other blast furnace operators as well as foundries are having difficulty in obtaining sufficient coke to maintain operations at present high levels.

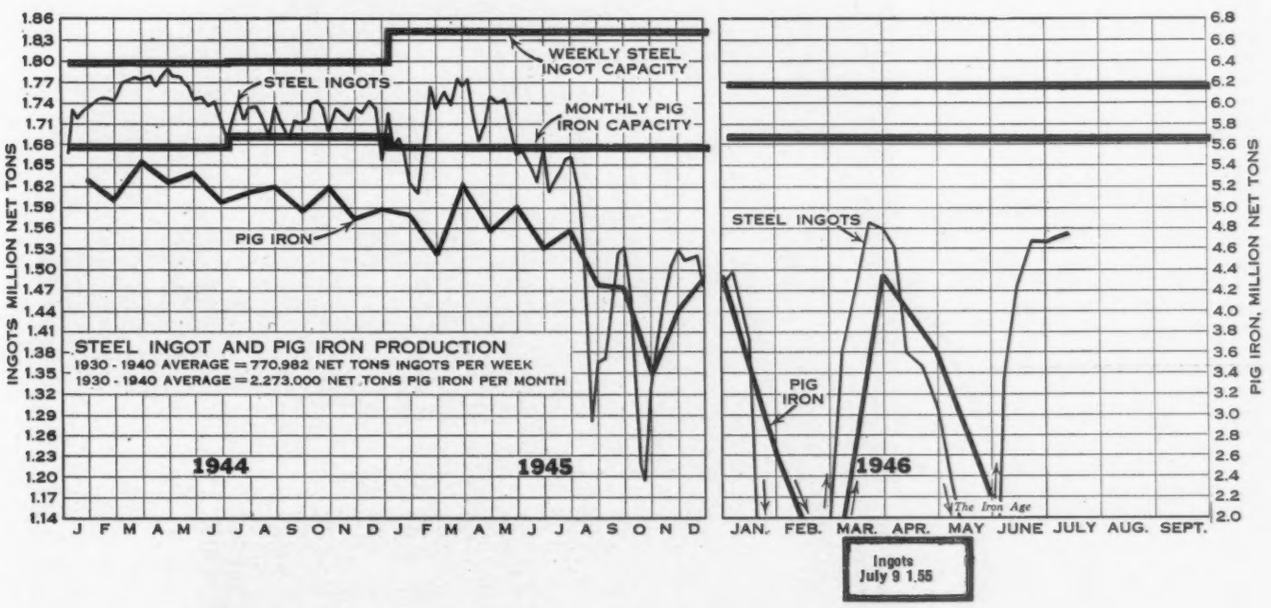
• **AUTO STEEL SUPPLY**—Steel supply in the automobile industry is reported to be tighter with every passing day; sheets, strip and cold rolled are critically short, but alloy steel is relatively easy to obtain. A producer of wheels requiring a considerable quantity of strip has been squeezed hard by the withdrawal of two suppliers from the Detroit market, leaving other hard-pressed steel producers operating under quota to carry the load. As a rule, major automobile producers have stuck pretty close to their regular suppliers but it is believed that parts makers have been placing duplicate orders with a number of sources with the hope that at least one source would come through.

• **ROLLING MILL SPACE**—Little or no open space will be available on mill schedules on any product except alloy bars and some types of stainless before first quarter of 1947. Mill quotas are filled to this date and some tonnages may be carried over into next year.

• **STOVE PRODUCTION UP**—Edison General Electric Appliance Corp. produced 4000 electric stoves recently. This is the highest output attained since the strike of the electrical workers. Peak production planned is 20,000 units a week. The delivery of vitreous enamel sheets are hindering further increases.

• **FARM IMPLEMENT LOSS**—Accumulative loss of farm implement production is three months total output of 80 to 90 pct of the industry. International Harvester Co. is short 35,000 tractors, 20,000 mowers and approximately 23,000 combines. Two long strikes in the industry remain unsettled. Dealers are receiving very little new equipment. Seeders on order since last winter in many cases have not been delivered. One of the largest farm implement dealers in Iowa reports he has received but four cultivators, two ploughs and seven tractors this year.

• **AUTOMOBILE PRICES**—The key to the future trend of automobile prices lies more with the dealer and the parts manufacturer than with the car producer. The National Automobile Dealers Assn. which has been hit hard by adverse OPA rulings has issued an appeal to dealers to keep car prices at OPA levels until Congress decides the fate of OPA. In the final analysis, however, car prices will be determined by the cost of steel and paint and lead and tin and rubber and what the parts maker charges for his products. With labor also largely beyond their control, automobile producers have less real control over the price of their product today than at any time in history.



Steel Ingot Production by Districts and Per Cent of Capacity

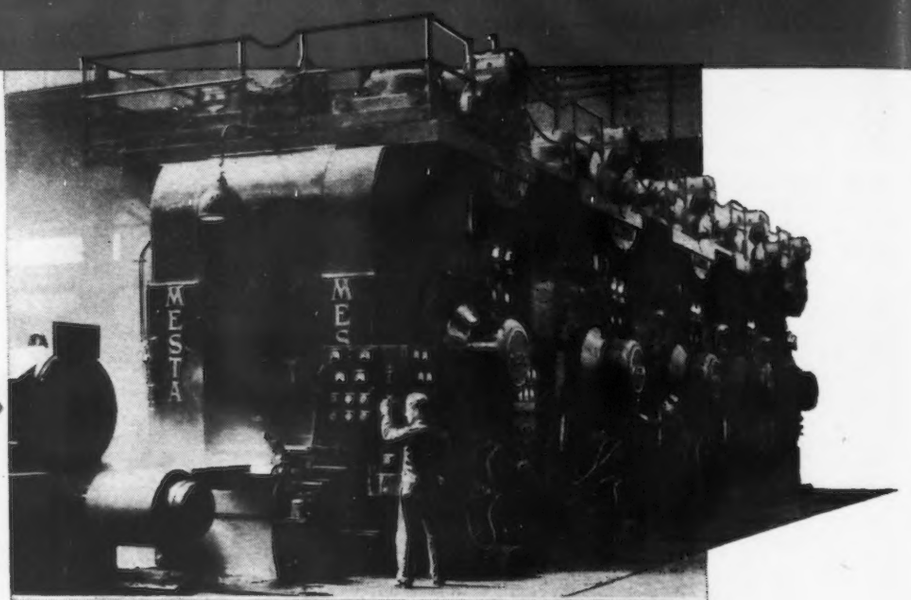
Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
July 2.....	97.0	88.5	88.0	85.0	88.5	70.0*	92.0	99.0	100.5	60.0	94.5	60.0	83.0	88.0*
July 9.....	94.0	88.0	87.0	85.0	88.5	102.0	95.0	99.0	100.0	60.0	96.0	60.0	89.0	88.5

* Revised.

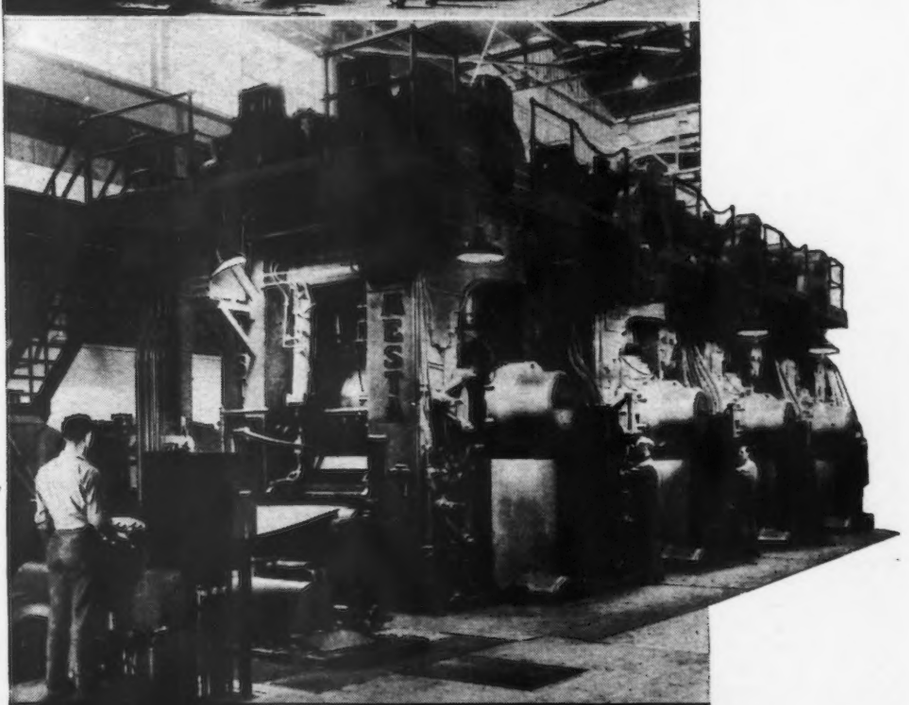
MESTA

HIGHER SPEED Four-High Tandem COLD MILLS

48" Four-High Five Stand Tandem Cold Mill



54" Four-High Four Stand Tandem Cold Mill



First in the industry with the Four-High Tandem Cold Tin Mill, Mesta has constantly maintained its position of leadership, and is building mills with delivery speeds which yesterday were considered impossible. These mills feature new types of drives and control systems which maintain synchronization during acceleration, deceleration and at normal operating speeds.

Foreign Funds for Purchase of American Steel Seen Unlimited

New York

By JOHN ANTHONY

o o o

• • • **Foreign nations** are hungry for exports of United States finished and semifinished steel products. Funds for the purchase of U. S. steel seem to be unlimited and most exporters agree that the source of the U. S. currency is the lending power of the Export-Import Bank. All steel exports at this time are based on the use of letters of credit here and terms are usually f.o.b. mill with freight allowed to seaboard.

During the war all steel exports required licenses. Now there are only a few products on the positive list which must be licensed. These are tinplate, galvanized sheets, uncoated wire—needed here for nail production—and pig iron. For some time there has been talk of including galvanized wire on the positive list. The mechanism of government control is for CPA to allocate tonnages of these products for export and the Dept. of Commerce Office of International Trade to distribute the overall tonnages among applicant nations.

The eagerness of foreign nations for steel has led to the entry of many commercial traders into the field, some of whom have little or no knowledge of the industry. There are many reports of the activities of these merchants in accepting orders and payment for steel and failing to make shipment, or they may make shipment of another product or gage than specified in the order, according to export sources. Reputable steel export merchants recommend that foreigners be cautious about placing their confidence and have their bank check on the financial standing of the firms with whom they expect to do business.

Under OPA regulations, which are being continued in effect by exporting mills and merchants pending congressional action, mill export prices are slightly higher than the f.o.b. mill base price and extras, plus the freight cost to seaboard. The schedule is based on the prewar schedule of the U. S. Steel Corp. Steel export merchants are permitted to base their prices on mill base and extras with rail freight costs to seaboard, plus the following premiums:

F.A.S. Value	Percent Commission	Minimum Commission
Up to $1000	12½	$20
$1000 to $4000	10	125
$4000 to $10,000	8	400
Over $10,000	6	800

C.i.f. shipments permit an additional commission charge of 1½ pct of f.a.s. value.

Some exporters are reported to have been obtaining additional compensation by having mill shipments made to steel warehouses before shipment. By this means they are entitled to make use of the warehouse price schedule plus freight to seaboard and export commission.

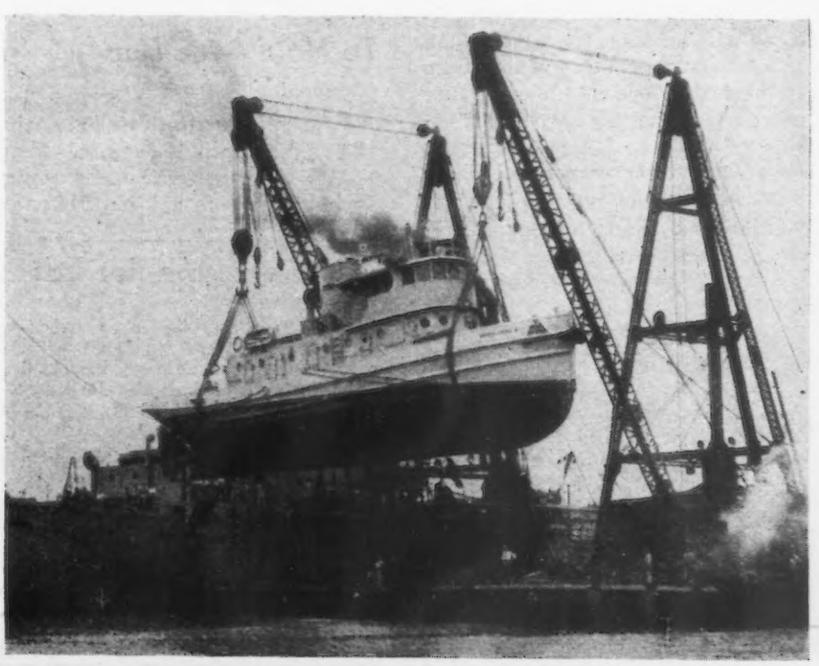
Before the war export merchants would quote prices based on what the market would bear. Their return was of course limited by competition. It is expected that if OPA is not continued, export pricing may be returned again to the discretion of the merchants.

Some mill export companies have established agencies or subsidiaries abroad, many of which operate warehouses. There is no price restriction on sales made by such subsidiaries except the price controls established by the foreign nation. Most of these agencies and subsidiaries were established in order to promote export sales, to operate warehouses abroad and to permit c.i.f. shipments.

Steel export mills and merchants are optimistic about the long-term prospect. They point to the tremendous reconstruction needs all over the world which will require many years to supply. Steel plant construction abroad, they say, will require 5 to 10 yr for completion and even then plant capacity will hardly exceed each nation's own immediate needs. Moreover, exporters believe, steel requirements of foreign nations will grow appreciably with the growth of their own steel industries.

Current steel exports of primary steel products are slightly below

TUG AHOY: *Larger than many of the pirate craft that sailed these waters is this* 185-*ton tug. Liberty ship crew is hoisting it aboard at New Orleans for a trip to China.*



prewar volume on a percentage of total production basis; on a tonnage basis they are somewhat higher. This volume is without reference to exports of war surplus steel products.

The long term prospect for steel exports is largely dependent on the supply of U. S. credits or currency at the disposal of foreign nations. Such credits are dependent upon the balance of trade between the U. S. and other nations or upon what are in effect loans to foreign buyers either through trade agreements based on U. S. credits or on international revolving credits. Loans and credit arrangements, based on past experience, might be considered in part as gifts to other countries or at best as subsidized exports, for it is widely recognized that they cannot be repaid in full.

While, generally speaking, steel exporters are pessimistic over the possibility of building up a large volume of imports to counterbalance a significant export trade due to the effect of industry pressure on congressional tariff action, one export official considers that too much emphasis is laid on this situation and points out that in the prewar period between 1935 to 1939 over 70 pct of our imports came in duty free. One steel industry official considers that the best way to equalize our trade balance is for Americans to vacation abroad in large numbers.

The present capitalization of the Export-Import Bank is $3.5 billion. The French-United States Agreement will account for $1.3 billion and about $1.5 billion had been earmarked before that loan. Other more recent credits have about exhausted the Bank funds. There is some talk of the expansion of the Bank's lending power.

Additional funds for export will be provided under the Bretton Woods Agreement by means of the International Monetary Fund and the World Bank. The Fund will have a total quota of $8.8 billion of which the United States is to subscribe $2.75 billion. The Bank's capitalization is to be $9 billion, of which the United States will furnish $3.175 billion.

These revolving credits and other direct loans, if granted, should provide the necessary funds for exports of steel in large volume to supply foreign requirements for many years.

WAA Adds New Export Divisions to Office

Washington

• • • **WAA has announced** the establishment of export divisions in regional offices at San Antonio and Houston, Tex., Boston and San Francisco. Offices probably will be opened also in the Seattle and New Orleans regions within 30 days. Meanwhile, WAA said that the New York region export division, which has been in operation for several months, has been averaging sales to the export trade for more than $500,000 a month.

The Washington export division has reported that 33,000 ft of 24 in. and 36 in. steel culverts, in oversupply, has been sold to Peru for use in the Pan-American highway.

The New York export division also has reported the sale of 330 gondola cars, 66 in. gage, for shipment to Portugal. Originally built for use in India and unusable in the United States, where the standard gage is 56 in., these gondola cars were sold for $140,250. Their acquisition cost was $1,700 each.

WAA officials said that exporters are showing more interest in surplus property since WAA has established the exporter as a normal channel of trade and has qualified him so that he can buy at sales-at-site and wherever the material is sold after the priority holders have been served and domestic demands satisfied.

To Hold Price Line

Cleveland

• • • **Steel distributors** composing the membership of the Steel Products Warehouse Assn. Inc., plan to hold the line against inflationary price increases, according to a survey made by Clayton Grandy, president.

Reacting to the termination of government price controls occasioned by the veto of OPA extender legislation, an industry-wide canvass of individual warehouses in this organization indicates no disposition to use the suspension of OPA as a basis for altering existing price policies established under the agency's regulations.

Preserve the Records

Washington

• • • **Acting under an executive order, OPA, defunct as a price control agency, has told manufacturers, wholesalers and retailers that they must preserve records until July 1, 1947. Executive order 9745, signed by the President on June 30, 1946, authorized OPA to continue all functions, powers and duties vested in it by the Emergency Price Control Act of 1942, as amended, and the stabilization act of 1942, as amended, which did not terminate by expiration of those acts on June 30.**

Two Southern Firms Raise Pig Iron Prices

Birmingham

• • • **One merchant iron** producer here has increased prices $3 per ton since termination of the OPA, a second had been granted a $4 a ton increase by the OPA before its termination June 30, and a third is awaiting developments.

Sloss-Sheffield Steel & Iron Co. has raised its price $3 per ton on the various grades of foundry iron it produces.

Republic Steel Corp. has notified its customers of a $4 a ton increase on basic and foundry iron produced at Birmingham. The OPA granted the increase on Republic's Birmingham produced iron as a hardship case.

Woodward Iron Co. is continuing to bill its customers at OPA ceiling prices but with notification that shipments are subject to later re-invoicing.

Bethlehem Plant Struck

Buffalo

• • • **An unauthorized strike** in the blast furnace dept. of Bethlehem's Lackawanna plant last week resulted in lost production of about 25,000 tons of steel. The men walked out Wednesday night after a dispute over a foreman's job. Six blast furnaces were banked and 27 openhearths were shut down.

In response to pleas of CIO United Steelworkers' leaders, the strikers returned to their jobs at 3 p.m. July 5, but pre-holiday production was not fully achieved until July 7.

About 600 men were affected, but mills maintained operations on a backlog of ingots. As a result of this stoppage, the Buffalo district ingot output fell 32 points below the scheduled 102 pct.

Steel Firms Waiting Impatiently for Settlement of Price Question

New York

• • • **Steel firms this** week were still waiting for some definite action on price controls and it seems certain that no price advances would be made generally until the fate of legislation now in making is known. Even then it is expected that if there are price increases in steel products they will be on marginal items and will not at this time represent a general across-the-board price advance.

Whether or not the increase in the price of pig iron in the South will reflect a movement among northern pig iron producers was still in the realm of speculation early this week. One pig iron producer in the South was still selling at former ceiling prices early this week, another had advanced his prices $3 a ton and another was selling at $4 a ton above the old OPA ceiling. The latter case represented one in which OPA permission had been granted before it passed out of existence.

The uncertainty over the price situation is causing some confusion in steel circles but as far as the customer is concerned he is more anxious to obtain steel, deliveries of which are now tighter than at any time since the early war days. Practically all steel has been sold on the basis of price at time of shipment, which to some extent constitutes a mild hedge for steel companies.

Chances are that steel firms will think long and investigate thoroughly before any major price advances are made. If OPA is not revived it is still doubtful that a general steel price increase will take place before the end of this year.

•

Pittsburgh

• • • **The threat of a revival** of some form of price control is still the main deterring factor on increased steel prices. Producers are sitting tight to see what will happen in Washington before making any move toward adjusting or increasing any prices. The exception to this is the pig iron price increase announced in Birmingham, where Republic put into effect an OPA-approved $4 a ton increase and Sloss Sheffield in that area increased prices $3 a ton.

The immediate change in steel prices may be an adjustment of arbitrary delivered prices. The recent increase in freight rates will result in price increases on products quoted on an "arbitrary delivered" price basis. These products include a wide variety of mill items that are shipped to the Pacific Coast, Gulf Ports, Detroit, Eastern Michigan, and other points on a delivered price basis. Further, an adjustment of basing point prices may be made by such a move, since basing point prices are, in effect, delivered prices at such specific points, plus switching charges.

The change in these prices will involve little more than the adjustment necessary to take care of the freight rate increase. On prices to consuming points that are not basing points, the price adjustment has already been made because such prices are made up of (1) steel price, (2) extras, and (3) freight. The change already made in such prices can be traced completely to the freight factor.

Prices most likely to break upward first are those of pig iron and scrap. A careful check of the Western Pennsylvania area failed to reveal any increase in the price of either of these commodities. However, overgrading of scrap is accomplishing the same as a price increase. Iron producers are still using an adjusted price clause on their invoices, anticipating an increase in iron prices but still withholding any such announcement.

•

Cleveland

• • • **Major producers** of steel, including wire products, anticipate no change in prices in the immediate future, particularly while the demise of OPA is being debated. Authoritative sources in the industry here point out that even if OPA is not revived, no broad price increases are likely, and that some adjustments on a few low profit items are the only factors in the price picture foreseeable at this time.

Faced with a very competitive market situation, machine tool builders are sitting tight. They anticipate no change in prices, in the event OPA is really gone. other than some adjustments on

MEDAL FOR BELL: *Frank B. Bell, chairman of the board of the Edgewater Steel Co., Pittsburgh, receives the highest civilian award from Secretary of War Patterson. The medal of merit was awarded Mr. Bell for his outstanding service during the war as chief of the Pittsburgh ordnance district.*

items which they are planning to bring out. Since most machine tool builders have not broadly applied the 20 pct OPA-granted increases, it is not considered likely that any price change will result in the present period of bafflement. Qualified observers predict that there will be no change in machine tool prices until costs go up. At the same time, some sources feel that the first place price increases will show up in the machine tool industry will be on those machines which are in long demand and on which there is a backlog of orders.

•

Chicago

• • • **All steel products** continue to be sold at the old OPA ceiling. Steel makers are not planning any immediate increases on any items regardless of the fact that such products as deep drawn sheet stock, galvanized, and some sections are being made at a loss. It is not expected that when prices are raised, as they will eventually be, that there will be any increase in the price of alloy or stainless products.

The price of rails, which for some time has been the subject of much discussion, may be one of the first items considered in any general price increase. Galvanized and ternplate are without doubt products that will have to be increased due to higher costs of nonferrous metals. It is the intention of the steel industry to await clarification of the scene at Washington before making any move on prices.

Pig iron prices remain unchanged here as producers await Washington action on price control. Industry sources state that they have not had sufficient time to make an accurate and fair calculation of the new price.

•

Detroit

• • • **It is expected** here that prices of new and used cars, and steel will remain at old OPA ceilings until some official action concerning the future of OPA is taken in Washington.

Car manufacturers have made no official announcement and there is no indication that any new price action is contemplated.

The Detroit Auto Dealers Assn. has announced that prices of new cars will be maintained at old OPA levels during the transition period. Similarly, Detroit used car dealers have adopted a policy of holding the present price lines until an official government decision is handed down. Although there are reports that individuals wishing to sell new cars have confidently expected they will be offered considerably more than old OPA ceilings for their cars, present indications are that used car dealers are now and will continue to resist such efforts to increase their prices of used cars.

May Wage Rate Reaches Record Level in Steel

New York

• • • **Average hourly, piecework** and tonnage wages within the iron and steel industry rose to a record of 135.8¢ per hr during May, according to the American Iron & Steel Institute. The previous record wage payment was 135.1¢ per hr set during March of this year. The April hourly wage was 134.1¢ per hr.

Employment, average hours and payroll figures declined in May from the previous month, reflecting the effects of the coal miners' strike.

The average number of employees in May was 562,900 compared with 581,800 in April.

Wage earners worked an average of 32.6 hr per week during May and 37.2 hr per week in April of this year.

The total May payroll for the industry was $121,422,200 compared with $134,347,800 the previous month.

Gets Largest Pipe Order

Milwaukee

• • • **The A. O. Smith Corp.,** Milwaukee, has received a $19,000,000 order for 1200 miles of 26-in. pipe from the United Light & Railway Service Co., Davenport, Iowa, consultant engineering and management unit for the United Light & Railway Co. system and all its subsidiaries. It is claimed to be the largest order ever placed for pipe and Smith officials estimate it will require more than 200,000 tons of steel and keep the pipe department busy for six months.

New York Ore Miners Still Out on Strike

New York

• • • **While the iron** ore workers in the Minnesota, Michigan and Wisconsin ore field have been back at work for several weeks following an 18.5¢ increase in hourly wages, more than 1000 workers in New York State ore mines are still on strike.

The majority of ore miners on strike in New York State are employed by Jones & Laughlin Steel Corp. and Republic Steel Corp. The workers, it is said, are still on strike for a signed contract and an 18.5¢ wage increase. Three local unions of the United Steel Workers of America are involved.

Six hundred members of two of the locals have been on strike since Jan. 20 while about 600 in the other local have been on strike since Mar. 17. The Jones & Laughlin mine was opened a few years ago for the purpose of furnishing beneficiated ores to the company's steel plants in Pittsburgh.

Announces No Change In Price of Surpluses

Washington

• • • **Prompt announcement** by Lt. Gen. Edmund B. Gregory, WAA Administrator, that there will be no change in surplus property prices regardless of the fate of OPA has caused some speculation here as to what restraining effect this policy might have on inflationary trends of new goods prices.

As a check against demand for new goods in the event of abnormal price rises, as of May 31, WAA had an inventory of roughly $2½ billion worth of capital and producers goods and $1½ billion in consumer goods to offer at bargain prices averaging around 40¢ on the dollar.

Admitting that retention of present pricing offered an opportunity for "exorbitant mark-ups and wholly unreasonable profit-taking" in reselling to the consumer, WAA was cold to the chance to up prices "with a view toward getting a larger return for the government." It decided in favor of a "hold-the-line policy for the better welfare of the nation."

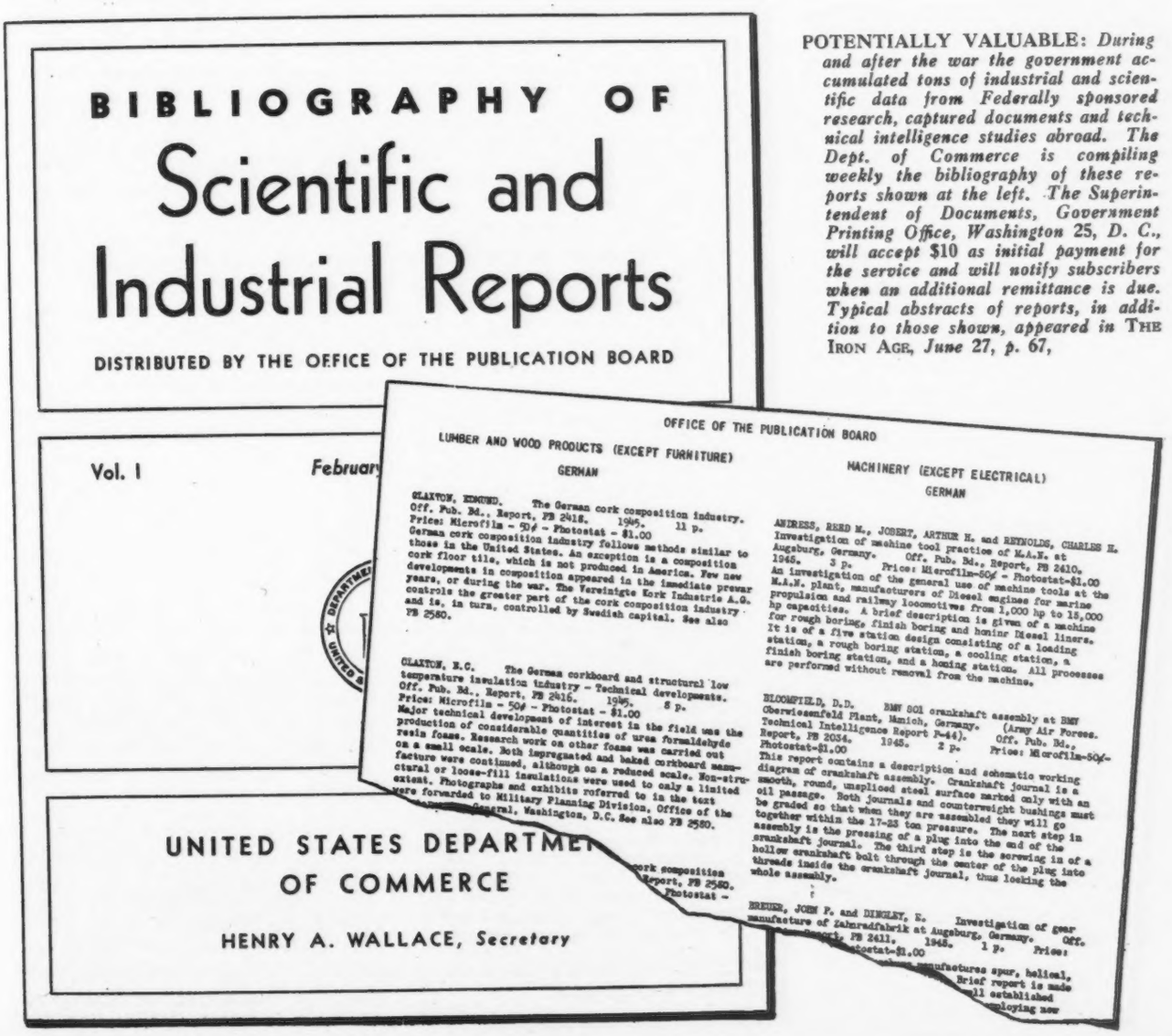
Metal Lath Producers' Basing Point System Is Basis of Complaint

Washington

• • • Charging them with "substantial suppression and elimination of price competition," the Federal Trade Commission has issued a complaint against the Metal Lath Manufacturers' Assn., Cleveland, and its 10 manufacturers, said to be the only manufacturers of metal lath in the United States. It is alleged that through the use of the basing point system and division of the United States into several geographical zones prospective purchasers within any one of the zones are quoted identical delivered prices regardless of the cost of delivery. One of the effects of the system, the commission said, is to preclude prospective purchasers from finding any price advantage in dealing with one manufacturer as against another.

A. J. Tuscany, commissioner and treasurer of the association and Joseph A. Sampson, Brooklyn, are charged with having participated in the practices with which the producers are said to have been engaged. It is also charged that with the aid and counsel of Mr. Sampson the manufacturers maintain a uniform method of quoting prices for metal lath sold to purchasers in the insular possessions of the United States. It is further charged that one of the defendants, the United States Gypsum Co., as owner of a patent covering the latest improvement on metal lath, has used it and license agreements in promoting the zone system of quoting identical prices.

The 10 manufacturers against whom the complaint was directed are: Alabama Metal Lath Co., Inc., Birmingham; the Bostwick Steel Lath Co., Niles, Ohio; Ceco Steel Products Corp., Omaha, Nebraska; Goldsmith Metal Lath Co., Cincinnati; Milcor Steel Co., Milwaukee; National Gypsum Co., Buffalo; Penn Metal Co., Inc., Boston; Truscon Steel Co., Cleveland; United States Gypsum Co., Chicago; Wheeling Corrugating Co., Wheeling, W. Va.



POTENTIALLY VALUABLE: *During and after the war the government accumulated tons of industrial and scientific data from Federally sponsored research, captured documents and technical intelligence studies abroad. The Dept. of Commerce is compiling weekly the bibliography of these reports shown at the left. The Superintendent of Documents, Government Printing Office, Washington 25, D. C., will accept $10 as initial payment for the service and will notify subscribers when an additional remittance is due. Typical abstracts of reports, in addition to those shown, appeared in* THE IRON AGE, *June 27, p. 67,*

No Steel Wage Demands By USWA Seen During Current Contract Year

New York

• • • **Some sources** close to the steel industry have expressed the belief that if prices continue to rise Philip Murray, head of the Steel Workers of America union, may be forced into a position of demanding higher wages before the present contracts expire. Such a fear, however, is unfounded, according to authoritative sources and it is expected that Mr. Murray will stick by his recent commitment that they would be no new wage demands during the life of the persent contracts most of which expire Feb. 15, 1947.

About the only situation which could alter Mr. Murray's stand would be one of such magnitude that there would be no question as to the necessity for changing his position, according to labor experts. Nevertheless Mr. Murray is known as a stickler for contract commitments and the chances are almost certain that no new wage demands will be made upon the steel industry until new contract negotiations are entered into.

On the other hand if there have been substantial increases in steel prices and a spiral in living costs as a result of the current price situation, it can be expected that Mr. Murray will remember this very distinctly when he asks for a new contract. It can further be expected that should such events take place he would make every effort to compensate for what he considered to be a backward movement in steel wages as related to living costs.

Before the war and before the present steel union became so strong attempts were made to separate the relationship between steel wages and steel prices. In later years, however, the two became so tied together that invariably an increase in wages was followed by agitation for an increase in steel prices or vice versa. Judging from this history labor authorities believe that any major change in steel prices next year or in the years following will be consistently tied in with subsequent demands for wage adjustments.

Nevertheless the major item on future demands by the steel union will be for some sort of a guaranteed annual wage. However such a request will probably be accompanied by demands for wage adjustments if inflation reaches a hectic point. Some light on these opinions may be disclosed when the USWA and the new Portsmouth Steel Corp. headed by Cyrus Eaton get down to brass tacks. A model management-labor relationship was referred to in a recent telegram by Mr. Murray when he congratulated the new company head.

SIGNED AND SETTLED: *Portsmouth Steel Corp. took title to the Portsmouth works of Wheeling Steel Corp. July 1. Here is Elmer A. Schwartz, president of the new company, signing the check with L. W. Franzheim, vice-president and treasurer of Wheeling Steel, looking on.*

Murray Welcomes Eaton

Pittsburgh

• • • **In a telegram to Cyrus Eaton, head of the new Portsmouth Steel Corp., Philip Murray, president of the CIO-USWA said: "On behalf of the USWA, I welcome you and Portsmouth Steel Corp. into the industry and extend best wishes to you and the firm. With your enlightened labor views and progressive industry outlook, I look for cooperation between Portsmouth Steel Corp. and the CIO, out of which may develop a union-management relationship to which industry and labor may look as a model."**

Ruttenberg Quits USWA To Go With Steel Co.; Golden Resigns Also

Pittsburgh

• • • **The resignation of** Clinton S. Golden, vice-president of the United Steel Workers of America, and Harold J. Ruttenberg, research director for the USWA, was announced by Philip Murray, president of the USWA-CIO. Mr. Golden is resigning because of ill health, but will continue to service the USWA in the capacity of liaison representative in governmental affairs and representative in the international organization.

Mr. Ruttenberg, research and statistical director of the USWA, is leaving the union to become vice-president of the Portsmouth Steel Corp. This company was organized a few weeks ago by Cyrus S. Eaton to supply Kaiser-Frazer Corp. and Graham-Paige Motors Corp. with part of their automobile sheet requirements. The plant at Portsmouth, Ohio, was purchased from Wheeling Steel. Kaiser-Frazer Corp. agreed to the purchase of 200,000 shares of Portsmouth stock and Graham-Paige to 100,000 shares. The purchase price was $12,000,000.

Mr. Murray stated that Mr. Golden, who will be succeeded by James G. Thimmes, USWA West Coast director, asked to be relieved of his duties two months ago because of his health. Mr. Thimmes was elected to the post at a recent meeting of the executive board of the union. The position of research director of the union has not yet been filled, according to union officials.

Mr. Golden and Mr. Ruttenberg have been with the CIO-USWA since its formation as the Steel Workers Organizing Committee under John L. Lewis. During World War II he acted simultaneously as vice-chairman of the War Manpower Commission and the War Production Board.

Mr. Ruttenberg served in various capacities on governmental boards, including a member of the minimum wage committee of the Dept. of Labor's Wage and Hour Division, assistant to the director of the WPB's iron and steel division, and the labor member of the Gray Iron Foundry Industry Commission.

Weekly Gallup Polls . . .

Public Looks to Democrats to Keep Wages Up

Princeton, N. J.

• • • A majority of voters with opinions on the subject regard the Democratic Party as better able than the Republican Party to keep wages at a high level.

This is an opinion which also prevailed among the voting public in polls reported in October 1945, and February of this year. However, a comparison of the current findings with the earlier polls reveals a drop among those who name the Democratic Party and an increase among those naming the GOP.

The views of the voting public are revealed in a coast-to-coast survey in which field reporters for the institute asked the following question:

"As you feel today, which political party —the Democratic or Republican—can better handle the problem of keeping wages high?"

The replies of all voters in the poll:

	Pct
Democratic Party	53
Republican Party	26
No difference	21
No Opinion	12

Following is a table giving the vote today in comparison with the earlier polls on the same question:

	Democratic Party Pct	Republican Party Pct	No Difference Pct
Oct., 1945	56	18	26
Feb., 1946	60	21	19
TODAY	53	26	21

These findings do not mean that voters think the Republican Party unable to maintain high wage levels if it were in the saddle in Washington. It means only that, on a comparative basis, the majority of voters think the Democratic Party is the better able of the two to handle the problem.

With one exception, all population groups analyzed by institute statistical experts name the Democratic Party as the one they would string along with on the issue of keeping wages up.

The exception is the Republican voters in the poll. More of them name their own party than name the Democratic Party as the one which can better do the job of maintaining high wages.

Group differences on the issue are shown in the tables below:

	Democratic Party Pct	Republican Party Pct	No Difference Pct
Union members	62	18	20
Veterans	57	21	22
Democratic voters	73	10	17
Republican voters	30	48	22
Manual workers	56	26	18

•

• • • **Would the South** be better off if, instead of having one dominant political party, it had two strong parties?

Many Southern intellectuals have claimed that their section would benefit by more party competition, and the average Southern voter is inclined to agree with that, especially if he lives in one of the less solidly Democratic states of the South. In a special poll of Southern opinion in 13 Southern states, interviewers for the institute questioned a cross-section of the voting population as follows:

"Do you think the South would be better off, in general, if there were two political parties of about equal strength instead of one strong party as there is at present?"

The same question was asked in three previous polls dating back to 1939. The trend of sentiment among those expressing an opinion follows:

	Yes, two parties Pct	No, one party Pct
1939	57	43
1943	59	41
1944	64	36
TODAY	62	38

In the last two surveys one person in every five (20 pct) expressed no opinion.

Many Southern leaders feel that the South would get more attention from Washington and have greater say in Democratic Party councils, if it were less solidly Democratic on election day. Too many Democratic administrations, they argue, have "taken the South for granted."

Opinion Samplings Indicate That Southern Voters Would Prefer Political Competition

o o o

While the South shows no evidence of leaving the Democratic fold on election day, it is noteworthy that in the less solidly Democratic parts of the South, sentiment in favor of a two-party line-up is considerably stronger than elsewhere in the South. In short, the more taste a Southern state has of an effective two-party system, the more it likes that system.

In the less solidly Democratic Southern states taken as a group —North Carolina, Virginia, Florida, Kentucky, Oklahoma and Tennessee—the vote favoring a strong two-party system is 69 pct. In the other states, South Carolina, Alabama, Arkansas, Georgia, Louisiana, Mississippi and Texas the aggregate vote is 51 pct in favor.

Analysis of replies shows, however, that a majority of Democrats with opinions in the survey favor the idea of a strong second party. This is shown in the table below giving the vote on the question among Democratic and Republican voters:

	Dem. Voters Pct	Rep. Voters Pct
For Two Parties	53	86
Against Two Parties	47	14

The main reasons given by voters who favor a stronger two-party system are that competition, in politics as well as in business or private enterprise, is essential to a sound democracy.

"Competition helps build ideas, and the South could sure use some new ideas," says one typical Southern voter polled.

The following table showing the percentage of Democratic vote of the Democratic-Republican total in each of the 13 Southern states for the last four presidential elections gives a picture of the extent to

(CONTINUED ON PAGE 136)

Says Price Question Keeps Dealers From Shipping Steel Scrap

Chicago

• • • **The shortage of scrap** which has been menacing the steel industry is even more acute now because of uncertainties which appear to have arisen in the minds of some scrap dealers and yards following the termination of the OPA, said Leigh Block, vice president of Inland Steel Co., Chicago, and a member of the committee on iron and steel scrap of the American Iron & Steel Institute.

"Apparently a sizable tonnage of scrap is being held back in the hope that higher prices eventually may be obtained for it," said Mr. Block. "This is a very disturbing development, coming at a time when the steel industry is making every effort to boost its production in order to make up the 19 million tons it has lost since VJ-Day as a result of strikes and work stoppages.

"Steel mills are offering to pay the full OPA ceiling prices on scrap. In view of present steel prices, which are not much higher than they were in 1937, the OPA ceiling prices on scrap are very fair prices.

"It is entirely likely that a majority of collectors of scrap may begin moving scrap again before long, as soon as they are convinced that mills cannot afford to go beyond the previous OPA ceiling prices. But, even a short period of reduced flow of scrap jeopardizes the steel industry's chances of increasing its operations.

"If scrap is held back for any considerable length of time, the steel industry will be forced to shut down some of its open hearth furnaces and its operations will recede."

The scarcity of scrap was first felt about a month ago, when the steel industry began to step up its operations after the end of the coal miners' strike.

In recent weeks scrap supplies at steel mills have been little better than in 1942, when some open hearth furnaces were idle because of lack of scrap.

Scrap Institute Head Clarifies Its Position

Washington

• • • **Edwin C. Barringer,** president and executive secretary, Institute of Scrap Iron & Steel Inc., early this week answered a statement made by the American Iron & Steel Institute scrap committee by admitting that the scrap outlook was serious but declined to accept any of the blame for his members.

Several times during the war it is remembered that the steel industry has made statements concerning the supply of scrap which in turn have been promptly answered by the scrap trade. In this latest instance Mr. Barringer said,

"The situation in scrap is admittedly a serious one and if any steel furnaces have to be taken out of operation neither the scrap nor the steel industry but the generally confused situation centering on OPA will be to blame.

"The supply of scrap is extremely short due to a number of conditions, among them the curtailment of production by strikes at steel-consuming plants, failure to return battlefield scrap in volume, the disappearance of the small scrap dealer and collector due to unworkable controls, and the general confusion attendant upon the expiration of OPA and uncertainty over its revival.

"For a number of decades, scrap dealers have maintained an adequate flow to steel mills and foundries under free-market conditions, and under wartime government emergency regulation supplied a record-breaking tonnage.

"The present situation is without precedent and the most difficult one either consumers or suppliers of scrap have faced.

"The OPA has not been realistic concerning scrap. In January it predicted a supply so ample by spring that prices would decline. Less than a month ago OPA refused to make its scrap schedule more workable, giving as its reason that no substantial benefit to the flow of scrap would result.

"Inventories of both consumers and dealers are at an all-time low. Dealers stocks of prepared scrap at 165,000 tons, according to the latest Bureau of Mines statistics, would supply consumers less than three days if every ton could be shipped promptly.

"The factor that is seriously lacking is the small dealer and collector, who, being a wartime casualty is no longer available to collect substantial tonnages of scrap that are dormant. Not until this small dealer and collector has been put back in business can the real margin of safety in the scrap situation be assured.

"The scrap industry can be counted upon to do everything in its power, considering the uncertainties of the market, to keep as much scrap as possible moving to steel mills and foundries."

Correction

Detroit

• • • **An error in THE IRON AGE issue of June 20 is a reference to a nickel coating ten times as thick as that normally used on motor car bumpers. On p. 86, line 4 the nickel coating should be 0.001. In line 5 of the second paragraph of the same column the first figure should be 0.0015. The second figure 0.002 is correct.**

New Firm Rents Plant To Build Motor Cars

Washington

• • • **Negotiations have been** completed by which the $170 million Dodge-Chrysler war plant in Chicago has been leased with option to buy to the Tucker Corp. of Chicago for a 5-yr period, it is announced by War Assets Administration.

Rental terms are $600,000 for the first year, $800,000 for the second, and $2,400,000 annually for the ensuing three years of the lease. The agreement provides that the Tucker Corp. may purchase the plant outright for $30 million at any time up to 4½ yr.

In addition to the real property, consisting of 475 acres on which are new concrete and brick buildings with 6½ million sq ft of space, the Tucker firm will lease selected machine tools and equipment from the approximately 8000 items available.

The Tucker Corp., headed by Preston Tucker of Chicago, has stated that it intends to engage in the manufacture of motor cars and expects to employ up to 35,000 persons after it gets into production.

Canadians Nervously Await Effects of Dropping OPA

Toronto

• • • **The abandoning** of OPA in the United States is providing considerable food for thought among industrial and government leaders in Canada. While much guessing has already been done with regard to the reaction in Canada of the dropping of ceiling prices across the line, so far nothing definite has been determined as to what will happen in this country. A number of steel and industrial interests interviewed by THE IRON AGE were decidedly vague in expressing opinions on the subject, although the consensus indicated that the greatest problems would have to be faced by importers who depend on the United States for raw materials and other supplies. At the time of writing no definite pronouncement regarding higher prices across the line has been forthcoming, with the result that interests on this side of the border have very little on which to base opinions. However, with OPA out of the picture, there is the feeling that it will greatly increase Canada's subsidy payments, especially on coal, textiles and certain foodstuffs, and some are of the opinion that subsidies may be extended to a number of other articles. Or it may speed the time when Canada, too, will abandon price control on all but a few special commodities and products.

Wartime Prices and Trade Board officials are giving considerable thought to the government's policy in meeting this new crisis, and a broad policy for recommendation to the government may originate from meetings of the Board. It has not been decided as to whether Canada will try to ride out the storm and pay higher subsidies on a number of items; whether to remove ceilings on articles which are expected to lose their OPA anchor, or whether it will be sufficient to caution Canadians to buy as sparingly as possible in the United States until the situation is clarfied.

What will happen with regard to iron and steel can only be a matter of conjecture at this time. However, should United States steel prices skyrocket, there will be two alternatives for Canadian importers, to pay the higher prices from across the line, or cut down imports and endeavor to obtain a greater volume of requirements from domestic producers. It does not appear likely that the government will lend a hand to steel consumers by payment of large subsidies on imports of these raw materials. Canadian manufacturers that depend largely on the United States for steel supplies do not look for government assistance in the event of higher prices going into effect across the line, other than a possible lifting of ceiling prices on their finished products, but even this is none too certain. As importers of steel, however, they will not be governed by Canadian ceiling prices, but will be permitted to pay U. S. prices, plus duty, freight and exchange, which would bring their laid down price far above domestic steel prices. There has been some guessing that instead of the 10½ pct premium on U. S. funds, something may be done to bring Canadian and U. S. funds nearer to a parity and if so some of the increased costs for U. S. steel would be eliminated.

Canada still depends upon the United States for approximately 25 pct of its steel requirements, mostly specialty grades, and any lifting of prices across the line would automatically boost production prices of finished products in this country. During the steel and coal strikes in the United States earlier this year, many Canadian steel consumers that previously acquired full supplies from across the line, swung to greater use of domestic steels and are continuing this practice, and there is the possibilities that others will fall into line if anything drastic develops with regard to U. S. prices. However, with the serious shortage of steel in Canada and the possibility of a strike that will almost entirely cut off iron and steel output here, importers are not prepared to take any rash action that may entirely shut off their source of supply.

Immediately upon the announcement from Washington of the dropping of OPA, a statement was made in the House of Commons to the effect that Canada is to continue ceiling prices under the direction of Wartime Prices and Trade Board direction. Thus it would appear that in some respects at least, price ranges in Canada and the United States soon may show wide variation, and while some importers, and especially those trading in iron and steel materials, will be forced to pay the higher prices, on some other commodities increased costs may be compensated for by government subsidies.

Labor Minister Humphrey Mitchell, speaking in the House of Commons, stated that with commodity prices skyrocketing in the United States he believes the Canadian dollar is sounder than its opposite number — the American dollar. (Ed. note: On July 5 Canada brought its dollar to a parity with the American dollar.)

References to the respective values in purchasing power of the Canadian and American dollar followed closely an announcement by Prime Minister King that the end of the United States' price controls will not alter the Canadian Government's present policy of retaining control on prices in this country. After explaining that there is no price or rent control in effect in the United States and no rationing, with the possible exception of sugar, Premier King said this situation has naturally raised questions in the minds of many Canadians and he is taking the opportunity to assure them that there is no intention of abandoning similar controls in Canada.

"Developments affecting prices in other countries, particular the United States, are not without their effect on Canada," said Premier King. "Our policies have in the past, and will in the future, necessarily continue to have such developments in mind. We in Canada have followed our own course which we believe is well adapted to Canadian conditions and to the Canadian economy. We shall continue to follow policies which we believe to be in the general interest, making from time to time, such modifications as seem to be required in the light of internal and external conditions as they develop."

CPA Advances Third Quarter Pig Tin Quotas 10 Pct. Over Second Quarter

Washington

• • • **Despite further** expected inroads upon government stocks, third quarter pig tin quotas have been increased 10 pct over second quarter and have also been combined for all products to allow manufacturers greater latitude in the production of tin containing products, it has been announced by CPA.

At the same time, controls have been established for the first time on secondary tin. These permit the same amount of tin containing metals (less than 98 pct but more than 1.5 pct tin) in processing and manufacturing operations as was used during the corresponding quarter of 1944.

Manufacturers and processors who were not in business during the third quarter of 1944 must obtain a quota for secondary tin from CPA.

Third quarter tin supplies are estimated at 11,900 tons as against estimated requirements of around 17,840 tons, leaving a deficit of 6440 tons. The estimated deficit for the second quarter was 6700 tons and government stocks are expected to be down to 24,000 tons of pig tin by the end of the current quarter.

Third quarter quotas are 110 pct of pig tin used during the second quarter including the extra-quota grants except for fluid milk shipping containers. Manufacturers of the latter will be allowed 25 pct of the yearly average consumption for the period July 1, 1938, to June 30, 1941.

Other provisions in the amended order are:

(1) All persons having possession or control of 2000 lb of pig tin on the first of each month and using more than 1000 lb of pig tin monthly must report such information on form CPA-412 before the 20th of the month.

(2) All persons using secondary tin must report such uses on form CPA-2919, which must be mailed to Bureau of Mines, College Park, Md.

(3) Purchases of wire solder containing 30 pct or less tin were formerly permitted without certification. All purchasers of solder in any form and in any quantity must now certify to suppliers that the acquired solder will be used strictly in accordance with the provisions of the conservation order (M-43).

(4) The use of tinplate containing 0.25 lb of tin to a base-box (31,360 sq in.) of tinplate is now permitted as optional to the use of terneplate. The tin required in the production of 0.25 tinplate, in general, is less than required in the production of terneplate. This provision not only conserves tin, CPA said, but also conserves highly crit-

Restrictions have been continued in the amended M-43 order on the use of tin in many products. Tin will continue to be prohibited in jewelry, ornaments, novelties, souvenirs, toys and games and many other ornamental and unessential items. This action does not prohibit the production of these articles, the agency said as most of them can be manufactured from other metals.

Makers of Food Boxes Receive Surplus Nails To Maintain Shipments

Chicago

• • • **Surplus nails are** being turned over as rapidly as they are declared, to box making companies, to keep the food moving, particularly shipments for UNRRA. During the last week of June two such local orders and one St. Louis box company order were filled.

War Assets Administration is setting aside, up to 30,000 100-lb kegs of box nails, 3 to 6 penny cement coated nails and bright common nails, for sale on the highest priority to box manufacturers certified by the Dept. of Agriculture. Mail orders submitted to WAA offices must bear the proper certification, obtained from the Washington office of the Dept. of Agriculture, production and marketing administration.

Two Chicago firms devoting a major share of their production to UNRRA food boxes for Chicago meat packers, declared that the nail supply situation was terrible and that Chicago box companies have been resorting to buying nails from retail hardware stores and trading one size for another with other nail using firms. Another company in Peoria, Ill., reported it already had on hand unfilled orders for seven months of nail production. One of the smaller producers in Chicago reported it had made no nails for more than two months and that it had numerous orders waiting to be placed in addition to four months production in back orders.

Nail production is being hampered by the limited amount of steel billets available. Other obstacles include a lumber shortage in the Chicago area, and a strike by the box making workers (CIO) who left their jobs in the middle of May. A large box making concern whose normal inventory is four million ft of lumber reports but 400,000 ft on hand.

CPA recently raised the CC (Commercial Priority) to equality with HH (Housing Priority) in an effort to help the box companies secure more lumber from the mills. Simultaneously the CPA opened the 50 pct set-aside to CC priorities, enabling box makers and other users of soft lumber to meet their needs in a better fashion.

Iron Ore Loadings Gain

Cleveland

• • • **The Great Lakes** Iron Ore fleet loaded 8,654,437 gross tons of the steel industry's basic raw material in June in comparison with only 3,616,115 tons transported down the Lakes in May, when only a small part of the fleet was active, handicapped by strikes.

The past month's total compared with 10,621,309 tons in June 1945, when the fleet was 100 pct active and "shaken-down" for the year. A majority of the ships were just beginning 1946 sailings around June 1.

A decrease of 1,966,872 tons, or 18.52 pct, was shown for the month in comparison with a year ago. For the year to July 1 the movement totaled 13,000,454 gross tons.

The London ECONOMIST

The Soviet Government

Reprinted by special permission to further understanding on how political and economic affairs are viewed in London.

o o o

NOT much attention has been given in this country to the reconstruction of the Soviet Government recently authorized by the Supreme Soviet of the Union. It is generally so much taken for granted that in Moscow Stalin alone counts that the composition of his government is not considered a matter of great importance. If, however, the question of the succession to Stalin's power were at any time to become actual— as it seemed to be for a moment a few months ago, when rumors of his incapacity through illness were in circulation — the current distribution of positions of authority among other men would obviously come to have a crucial significance, and even now it certainly matters more than is commonly supposed. For in spite of the undisputed preeminence of Stalin, which goes far enough to justify talk of an autocracy, the Soviet Party-State has a definite structure which is by no means an empty form and should not be ignored.

One of the acts of the recent session of the Supreme Soviet was to change the title of the Council of People's Commissars to that of Council of Ministers. This change is in line with previous restorations of pre-revolutionary names of officers' ranks in the army and of administrative terms such as "ukase." However, the Soviet regime has for so long been associated with "People's Commissars" that a fairly strong motive must have been present to account for such a return to past usage. A Council of Ministers certainly sounds more normal in the ears of foreign nations and a desire for the appearance of normality may have been one reason for the decision, but it is unlikely that it was the only reason. For Russians "ministers" used to be the Tsar's ministers; they were appointed by him and responsible to him. The People's Commissars, on the other hand, were appointed in theory by the people as represented by their highest elected Soviet and all kinds of executive officials shared the title of commissar.

Today the Supreme Soviet still retains the formal right of appointment of the ministers, but they are invested with a title which subtly conveys a far greater impression of authority and eminence than that of commissar; moreover, as Stalin though in form himself one of the ministers, also bears by constant official publicity the super-constitutional title of "Leader of the People," the rest of the ministers can be regarded as *his*, personally chosen by him for his service. The verbal change thus confirms the elevation of the government above the elected assembly of which in the older conception it was merely an emanation, and emphasizes the special position which Stalin has in fact long held in the Soviet system.

A second feature of the new Council of Ministers is the great increase in the number of portfolios as compared with the pre-war Council of People's Commissars. The new Council consists of a chairman, eight vice-chairmen (of whom four hold portfolios), forty-five other ministers holding portfolios and three other office-holders who are apparently included in the Council without bearing the title of minister — fifty-seven persons in all. But the ordinary ministers are grouped in subordination to the eight vice-chairmen in such a way that they may be regarded as under-secretaries, while the chairman and vice-chairmen form the real "Cabinet."

The multiplication of ministries is for the most part related to the administrative needs of a socialized economy and continues the increased specialization characteristic of the war emergency period, when new commissariats with directly responsible heads and separate competence were frequently created to deal with special problems of production and supply. Thus there is now a minister for the coal industry of the western regions of the Soviet Union, and another one for the coal industry of the eastern regions; there is a corresponding pair for the oil industry; there are separate Ministries of Electric Power Stations and of Electrical Industry, of Shipbuilding, of Mercantile Marine and of River Transport, of Iron and Steel, of Heavy Industry Enterprises Construction, of Heavy-Machine-building, of Machine Tools, of Armaments and of Military and Naval Enterprises Construction, of the Building Materials Industry and of Building and Road Construction Machinery.

It has evidently been decided on the basis of experience that there is an advantage for socialist administration in the splitting-up of large economic ministries, and this process can be carried a long way without unduly weakening "the Government" because of the concentration of control in the hands of the chairman and eight vice-chairmen. The system is further capable of reconciling a high degree of specialization with unity and coherence of direction because one of the eight vice-chairmen, Vosnessensky, is chairman of the State Planning Board, which coordinates the whole economic activity of the Soviet Union, while the chairman and six of the vice-chairmen are also members of the highest policy-making organ of the All-Union Communist Party—that is to say, the Politburo.

Not counting Kalinin, who died on June 3 this year and has not yet been replaced, the Politburo at present consists of ten members, namely Stalin, Andreyev, Zhdanov, Molotov, Voroshilov, Kaganovitch, Mikoyan, Khrushchev, Beriya and

(CONTINUED ON PAGE 137)

To Channel Merchant Pig Iron Into Farm Machinery and Building Products

Washington

• • • **Steps were taken** this week to channel critical merchant pig iron and malleable and gray iron castings into production of specified farming machinery and residential building products. This follows the pattern of steel certification (THE IRON AGE, June 20, p. 116).

Under a CPA order, effective July 9, manufacturers of the specified items may place certified orders for pig iron and castings in the amounts needed to continue full production for the third quarter. Such orders must be scheduled for production ahead of all others except those covered by specific written CPA directives.

In addition to railroad brake shoes, items for which orders may be certified are—

Farm machinery and equipment: Combines, grain binders, corn pickers and binders, ensilage cutters and field ensilage harvester (row type), potato diggers and pickers (except walking plow type), bean cutters and pullers, sugar beet and cane harvesting equipment, peanut pickers and diggers, farm haying machinery except field bale loader, corn shellers, potato sorters and graders, fruit and vegetable graders, washers, sackers and conveyors, wheel type farm tractors, and repair parts for the foregoing.

Residential building products: Cast iron soil pipe and fittings, cast iron pressure pipe and fittings, cast iron radiation (tubular and convector), warm air and floor furnaces, bathtubs, sinks, lavatories, low pressure cast iron boilers, and screwed pipe fittings in the following classes—2-in. and under gray cast recessed drainage, 3-in. and under gray cast steam fittings (125 lb SWP), and 2-in. and under malleable fittings including unions (150 lb SWP).

Orders already placed and scheduled for delivery before Oct. 1 may also be certified without specific authorization. But manufacturers may not certify orders which call for more than the actual amount they will place into production during the months of August and September.

Foundries are not bound to accept certification on a previously accepted castings purchase order or a new one received after the first day of the month in which delivery is requested; certifications for pig iron need not be accepted if received later than the 25th of the month preceding requested delivery.

Foundries themselves may not place certified orders without specific authorization by CPA, however. If the foundry itself makes the specified items, applications may be made on form CPA 4475 (manufacturers may use form CPA 4466, revised). The application should be filed not later than July 15 and return will be made not later than July 25.

The CPA may issue certified purchase orders in cases of unusual urgency in the case of certain governmental agencies such as Army, Navy, Veterans Administration, etc., but relief for other manufacturers will not ordinarily be granted.

SURPLUS SCOOTER: *Former paratroop scooters are in service as interplant messenger and light delivery vehicles at Lear, Inc., Grand Rapids, Mich.*

Suppliers Must Retain PR Orders on Schedules

Washington

• • • **No price discrimination** may be made against rated orders, CPA has announced, adding that suppliers, in the event of price changes, must give buyers with preference ratings at least seven days in which to agree to new prices.

Under the terms of an amendment to Interpretation 2 to PR 1, it is provided that when no OPA ceiling price is in effect "there can be no discrimination in price against a rated order, or between rated orders of different customers of the same general class."

The amendment also provides that when a price increase occurs after a rated order is accepted, the seller must continue to treat it as a rated order if the purchaser is willing to meet the increased price. This applies when the seller's regularly established price is increased for all customers in the class to which the person placing the rated order belongs, or when the Office of Price Administration ceiling price, if any, is raised.

A seller must not remove a rated order from his shipping schedule until he has given the buyer adequate notice of his intention to do so and the buyer has had adequate time (in any case not less than seven days) to agree to the new price.

Construction Steel...

Washington

• • • **The Goslin-Birmingham Mfg.** Co., Birmingham, Ala., has been awarded a $120,041 contract by the Bureau of Reclamation for the manufacture of five 72-in. regulating gates for the outlet works at Anderson ranch dam on the Boise project in Utah.

New York

• • • **Fabricated steel awards** this week included the following:

1200 Tons, Mexico City, theatre building to Virginia Bridge Co., Roanoke, Va.

1700 Tons, Chicago, office building for Illinois Bell Telephone Co., to American Bridge Co., Pittsburgh.

745 Tons, Sacramento, Calif., cannery building for Campbell Soup, to Herrick Iron Works.

450 Tons, Fairfield, Me., state bridge, to American Bridge Co., Pittsburgh.

200 Tons, Great Barrington, Mass., state bridge to Bethlehem Steel Co., Bethlehem, Pa.

• • • **Reinforcing bar inquiries** this week included the following:

305 Tons, Oakland, Calif., Orinda filter plant extension, East Bay Municipal Utility District, bids open July 10.

110 Tons, Green Bay, Wis., Fort Howard Paper Co.

100 Tons, Flint, Mich., assembly plant for Chevrolet Motors.

Farm Machinery Output Rises 20 Pct in May

Washington

• • • **May farm machinery** production increased to $58,469,486, a 20.3 pct gain over April of $48,591,534, CPA has announced.

Contributing largely to the increased output was the settlement of the strike at the International Harvester Co. plants. Production was still handicapped, however, by continuation of the labor-management disputes at the J. I. Case Co. and the Allis-Chalmers Mfg. Co. (The Case strike has been in effect more than six months while Allis-Chalmers has been closed down since early in May).

Although there appears to be no early prospect of strike settlements at these plants, July production is expected to exceed the production peak established in January ($61,199,366), because CPA's recently established self-certification program providing priorities on steel for farm machinery becomes effective this month.

Urgency Ratings Extended

Washington

• • • **Formerly granted** only for the purchase of WAA surplus equipment, CPA urgency certificates may now be issued to eligible persons for materials as well. An amendment to Direction 16 to PR 13 now provides that anyone requiring either material or equipment to sustain or increase production of critical products as listed in Schedule 1 of PR 28 may be granted urgency certificates which give the holder precedence over any other class of buyers of WAA stocks or surplus.

Provision has also been made in the amended direction to issue urgency certificates to war contractors if the War or Navy Depts. or the Maritime Commission certifies that the contractor's inability to obtain the desired material or equipment from other sources will have a serious effect on the defense program or the health and welfare of the enlisted personnel.

Urgency certificates for steel in the shapes listed in Schedule 1 of General Preference Order M-21 (covering iron and steel, including ferro alloys and associated materials) may be issued only to producers of the products listed in Schedule A of Direction 12 of the order.

C-I Steel Corp. Rate In Pittsburgh Hurt By Hostlers' Strike

Pittsburgh

• • • **A strike of 32** hostlers of the Union Railroad Co., concerning their union affiliations slightly affected the Pittsburgh operations of the Carnegie-Illinois Steel Corp. The strike, which started July 5, resulted when a mediation board ruled that the 32 hostlers would have to change their union affiliations from the CIO-USWA to the Brotherhood of Locomotive Engineers. Supporting the hostlers in their strike were about 400 CIO-USWA mechanical workers of the Union railroad.

As a result of the change in union affiliations, the hostlers would lose accumulated seniority rights in the CIO-USWA. Negotiations to end the strike were successful on Monday, July 8, and a major shutdown of steelmaking operations was thereby averted.

OLD TIMERS: *These men here from the Northeastern Chapter of the American Foundrymen's Assn. have worked in the foundry industry 50 or more years. One of them has served for 65 yr.*

Industrial Briefs . . .

• BUYS BUILDING — U. S. Air Conditioning Corp. announces that it is now operating in the new plant recently purchased at 33rd and Como Ave. SE, Minneapolis. The new building provides approximately 100,000 sq ft of space.

• ACQUISITION — The Indiana Steel Products Co., Chicago, has acquired the plant and facilities of the Cinaudagraph Corp. of Stamford, Conn., and began operation under the name of the Indiana Steel Products Co., Cinaudagraph Div.

• REOPENS WAREHOUSE—U. S. Steel Supply Co., subsidiary of U. S. Steel, has resumed operation of its Boston warehouse after more than three and a half years' service to the U. S. Navy, and simultaneously announced the appointment of C. D. Surette, Jr., as district manager to head the Boston organization of the company.

• TO BUILD PLANT — Diamond Alkali Co. has received the approval of the CPA to construct a $5,750,000 electro-chemical plant at Houston, Tex., for the manufacture of chlorine, caustic soda and muriatic acid. Construction at the newly-purchased 280-acre plant site will begin in about 60 days. The new plant will include eight buildings, covering about 40 acres.

• TC&I OPENS OFFICE — The Tennessee Coal, Iron & Railroad Co., Birmingham, has established a district sales office at 409 W. Adams St., Jacksonville, Fla., to serve Florida and south Georgia. Robert P. McGregor, a member of the company's sales organization since 1937, has been appointed manager of the Jacksonville office.

• CASE EXPANDS — The J. I. Case Co., Racine, Wis., has purchased a portion of the tank arsenal near Bettendorf, Iowa, at a reported price of $1,250,000.

• NEW OFFICE BUILDING—Eaton Mfg. Co., Massillon, Ohio, is constructing a two-story office building in the downtown section, which will house personnel employed in administrative, advertising, employment, cost, engineering and purchasing departments.

• NEW DIE MAKING FIRM — A new name was announced to the die casting and plastic injection molding industries recently when the Tool and Die Div. of Lester Engineering Co. was reorganized under the name of The Lester-Aetna Tool & Die Co., and moved from Cleveland to Warren, Ohio.

• NAMES CHIEF ENGINEER — Charles B. Bryant has been appointed chief engineer of the technical board of the Wrought Steel Wheel Industry, succeeding C. T. Ripley, resigned. Mr. Bryant was formerly field engineer, Portland Cement Assn., materials engineer, Maryland State Roads Commission, engineer of tests, Southern Railway System, and assistant to vice-president of the Southern Railway System.

• TO HEAD SECTION—Dr. W. A. Archibald has been appointed head of the refractories section of the chemistry dept. of the British Iron & Steel Research Assn. He has previously carried out research on steel slag refractory problems at the Royal Technical College, Glasgow, and for the past 7 yr has been associated with General Refractories, Ltd., of Glasgow, as technical manager.

• STEEL WAREHOUSE—Allegheny Ludlum Steel Corp. will complete in July a new tool steel warehouse and office building at Dayton. It will serve southern Ohio, Kentucky and a part of eastern Indiana.

Canadian Base Metal Producers Ask Sharp Increase in Prices

Toronto

• • • **Canadian producers** of copper, lead and zinc have presented a brief to the Wartime Prices and Trade Board requesting that Canadian prices for these metals be brought in line with world markets. The brief points out that Canadian mines must have United Kingdom and other world markets for their future welfare and these markets are being undermined by the continuance of ceilings which give domestic consumers, and hoarders, the lowest priced base metals in the world.

The chief complaint of Canadian copper producers is that their costs are on the rise but they are held down to a limited price for the bulk of their copper sales. Electrolytic is selling in world markets for more than 16¢ per lb, Canadian funds, while the domestic price remains at 11.5¢ per lb.

It is reported that Canadian purchasing agents are buying all the copper they can and the domestic demand is so great that producers are having serious difficulties in meeting United Kingdom commitments. Owing to the shortage Canadian output has not been sufficient to supply first half year sales commitments to the United Kingdom with the result that there will be a substantial carry-over of tonnage into July.

The Canadian trade is said to be taking advantage of the abnormally low domestic price to pick up all the copper they will require for a long time into the future.

Luria to Represent CF&I

Pueblo, Colo.

• • • **The Colorado Fuel** & Iron Co., large western producers of pig iron, steel ingots and hot-rolled products have announced the appointment of Luria Bros. & Co., Inc., founded 1889, as their scrap broker. Luria Bros. & Co., Inc. have opened an office at Pueblo, Colo. John L. Crum, former assistant purchasing agent, CF&I, will act as Luria Bros. Colorado district representative.

Canada May Face Steel Strike If Unions Find Wage Offers Too Low

Toronto

• • • **The National Advisory Wage** Committee of the United Steel Workers of America (CIO) met here June 29, and decided that unless reasonable wage offers were advanced by the Big Three of the Canadian primary steel producers before July 12, the companies would be notified on that date that a strike would be called shortly afterward.

Involved in the dispute are the Steel Co. of Canada, Ltd., Hamilton; Algoma Steel Corp., Sault Ste. Marie, and Dominion Steel & Coal Co., Sydney. The union demands a minimum $33.60 weekly wage, a 40-hr week, and holidays with pay.

Possibility of an immediate strike at the Hamilton Works of the Steel Co. of Canada developed July 4, when the union charged the company management with sponsoring distribution of petitions in the plant, promising wage increases in return for a no-strike pledge. Following the report of the circulation of the petition in the Steel Co. of Canada plant, the following wire was addressed to Local 1005 by C. H. Millard, Canadian director of the United Steel Workers:

"Have reported Stelco move to circumvent collective bargaining with our union and contempt of commission now dealing with the steel dispute to the Dept. of Labor officials in Ottawa and to Commissioner Roach. Unless these company sponsored petitions offering 12½¢ an hr increase and two weeks' vacation after five years' service, in return for a no-strike pledge are immediately withdrawn from circulation in all departments of Hamilton works, you and local Stelco committee are hereby authorized to take any action deemed necessary under the circumstances."

(Figured on an hourly basis, the union's demands at Stelco amounts to an increase of 19½¢ an hr.)

Mr. Justice Roach stated that when he heard of the situation with regard to the petition to Stelco workers, "I immediately communicated with representatives of Stelco and received from them assurances the company was in no way responsible for the circulation of the petition, had no knowledge they were being circulated, apart from a rumor they had heard earlier in the day before I got in touch with them; that some group of employees was said to be doing this, and the company would investigate immediately, and if it were true would have it stopped, since it is absolutely against company regulations to circulate any petition on the premises."

At the present time, due to strikes across Canada more than 28,000 workers are idle, with the industrial sections of Ontario bearing the brunt of labor-management strikes, with about 18,000 involved in this Province.

Steel Co. of Canada Finds Steel Demand At New Peak Levels

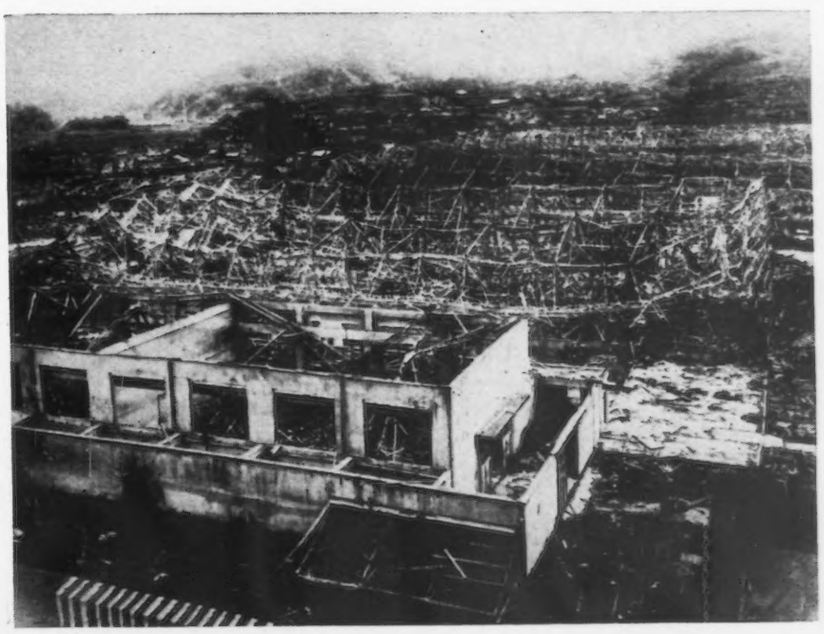
Toronto

• • • **The steel controller** is investigating Canada's steel situation with the aid of producers and consumers. The Steel Co. of Canada reports demand for steel in Canada at this time is greater than ever before, greater even than during the war years when company facilities were taxed to capacity and when supplies of steel available in Canada were augmented by large tonnages imported from the United States.

The Steel Co. of Canada reports that it is making all efforts possible to meet the demand of increased production, which is more than double that of the maximum prewar years. Other Canadian steel producers also are doing their utmost to meet the growing demand and it is estimated that it will take at least 2 yr before supply and demand meet a parity.

Owing to the heavy carryover in steel sheets some Canadian producers did not open their books for third quarter and point out that backlogs will absorb all production to the end of September. Some bookings are reported on new carbon bar orders but the supply situation continues tight. Demand for steel plate is pushing ahead at a rapid rate and mills now report solid bookings for third quarter while railroad car and locomotive builders state that they are having difficulty in obtaining sufficient tonnage to enable them to maintain present operating schedules. Structural steel shapes also are in short supply and many building projects, including new bridge construction are being held up and will not get underway until 1947.

TORPEDOED: *This is the wreckage of a torpedo plant in Nagasaki after atomic bomb No. 3 which ended the war had been dropped.*



MACHINE TOOLS

. . . News and Market Activities

June Shipments and Orders Held Firm

• • • **While machine tool** sales volume in June was somewhat below the average for the year, according to sources in the trade, new firm orders and shipments have held up amazingly well in view of the chaotic conditions affecting many customers and suppliers.

Many qualified observers felt that May would prove to be a poor month, but on the basis of figures recently released, compiled from 192 reports, it is apparent that May business turned out to be better than anticipated. New orders totaled $28,408,000; cancellations, $2,231,000; unfilled orders, $182,888,000; and estimated shipments for the entire industry amounted to $26,580,000.

In some quarters, May shipments were considered relatively small, despite the fact that machine tool capacity at the moment is pretty largely dependent on materials. Theoretically, the industry's capacity is about $60,000,000 a month, in shipments, when in fact, the industry's shipments have not approximated more than half of this amount in any month thus far in 1946.

At the same time, it is significant that 27.28 pct of the unfilled orders, as of May 31, were for foreign shipment, and 22 pct of the new orders received during May were also for foreign customers. Cancellations during May were heavier than in any previous month in 1946, and in this regard, informed sources point out that some sizeable foreign shipments were canceled during the month.

If present anticipations may be used for a yardstick, June business will not measure up to May when figures for the industry are released. According to some observers, June is a seasonably bad month anyway, and with deliveries held up for motors and controls and other components, the figures will reflect bottlenecks that have beset many builders. This situation is amply evidenced by one of the major producers of electric motors, who is now quoting more than two years' delivery on some types and a year and a half on most. The great duplication of orders which doubtless exists is also leading to great discouragement.

Discontinuance of OPA will not mean price increases in the machine tool industry, at least at the present time, according to most observers. Inasmuch as most builders did not exploit the 20 pct increases which OPA granted them to the full extent, it is considered likely that only new models being put on the market will be priced a little more liberally. There is also the fact that some companies can make better deliveries than others, a point that must be considered in any plans for price raising.

As of May 15, the on-hand inventory of machine tools amounted to $656,658,927, an increase of approximately $17,000,000 over the Apr. 30 inventory and indicated that acquisitions of machine tools declared surplus for sale continue to run ahead of actual sales.

In the Detroit area the suspension of OPA controls is expected to make little difference in machine tool prices. Dealers realize that it will be to their advantage to keep business on an even keel and there is no outward indication that price levels will be broken through until specific action by Congress or the industry as a whole indicates the course to be followed.

Slow deliveries of materials, particularly electrical motors and controls, have set back production schedules of machine tool builders appreciably. There is no noticeable change in the volume of business being transacted either domestically or abroad. Sales of surplus materials are continuing at about the same levels as previously reported.

Cincinnati manufacturers of heavy machines, particularly planers, indicate that for the first time in the current year orders are now exceeding current shipments and a modest backlog is being built up. At the same time, manufacturers indicate that the spread of business is now about equal between domestic and foreign users. So far as types are concerned, virtually all are in customary proportion in present ordering. One or two builders indicate that opportunity for price relief on machine tools caused one or two instances of customers going to WAA for machine tools, and while these surplus machines are somewhat of a problem in the market, so far they have not cut too heavily into current business.

Abandonment of OPA has brought no change in machine tool prices in the Boston area. Continued low prices asked for surplus tools has been a check on any upward revision in new tool prices and at the same time discouraged manufacturers from entering into competition with surplus equipment values. An encouraging factor from the makers' viewpoint is that occasional new tool sales are made despite surplus tool bargains.

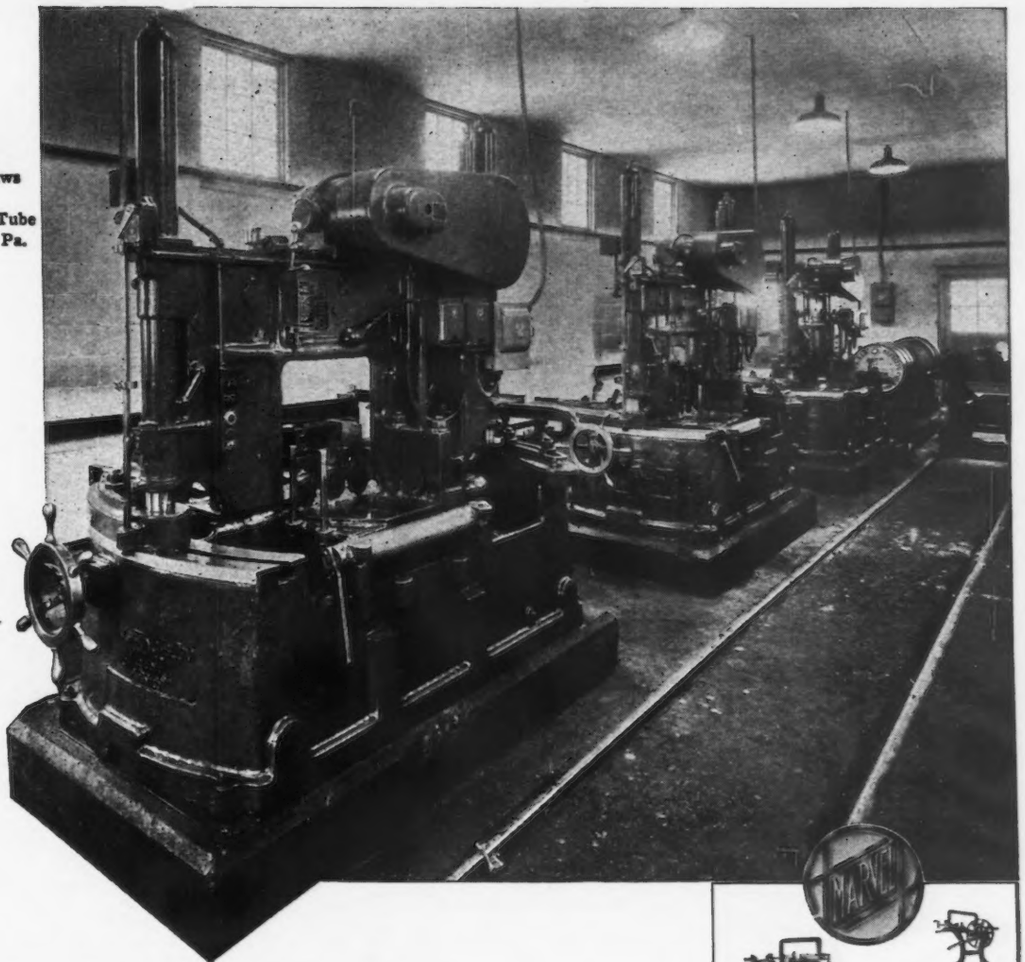
However, the new tool market is quieter than last month. Those producers who did an excellent business during the first quarter report a drop in the second which gathered momentum during June. Were it not that metal workers occasionally want a certain tool for a certain job and the tool cannot be found in the surplus offerings, things would be rather flat, according to a majority of the new tool trade. But with all talk of declining business, New England tool manufacturers in most instances have a backlog which insures at least 40-hr weekly operating schedules for the third quarter. Plastic molding machines, die casting machines and engine lathes appear to be selling more frequently than other types of tools.

Reed-Prentice Net Up

Worcester

• • • **F. S. McIntyre,** president of the Reed-Prentice Corp., says its backlog of orders is $6,250,000, and that prospects for the balance of the year are favorable.

Net earnings for the period Jan. 1 to June 15, after taxes, was $622,000, whereas for all of 1945 the net after federal taxes of $1,170,000 was $301,899.



3 MARVEL #18 Hydraulic Hack Saws at the Babcock & Wilcox Tube Co., Beaver Falls, Pa.

EASILY CUT-OFF TOUGHEST STEELS

Steels just don't come too tough for MARVEL Giant Hydraulic Hack Saws. Take, for example, the three No. 18 MARVEL Saws, at the Babcock & Wilcox steel mill, shown above. These machines are used to cut test specimens from sample pieces of stainless and other tough alloy billets which are checked for seams, pipes, etc., before being drawn into tubing. It takes tough steel to make the best tubing, and it takes modern sawing equipment to cut it rapidly, accurately and economically.

With 10 types of metal-cutting saws, each available in a series of variations, MARVEL can furnish sawing machines that exactly meet your requirements. If you have a metal-sawing problem—call in the local MARVEL Sawing Engineer.

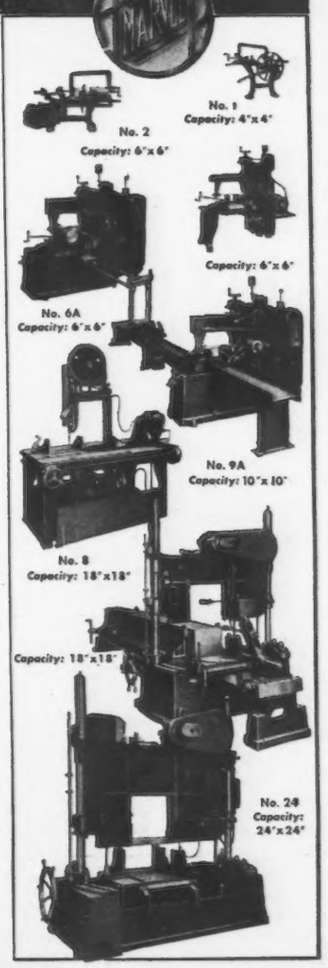
Write for MARVEL Catalog or check it in your Sweet's Catalog Files

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Ave. Chicago 39, U. S. A.

***Eastern Sales Office:* 225 Lafayette St., New York 12, N. Y.**



MARVEL SAWS

NONFERROUS METALS

. . . News and Market Activities

Tin Output Remains Below Prewar Level

New York

• • • **Worldwide tin** production for the first three months of 1946 has reached only 20,000 metric tons, equivalent to one-half the average output for the years 1934-38, and 32 pct of the average for the same period in 1941, according to estimates of the International Tin Research & Development Council, located at The Hague.

The council in its current bulletin also estimates world consumption at 50 pct of the corresponding 1934-38 average, or 21,000 metric tons. Peak consumption year was 1937 when average consumption per quarter reached approximately 50,000 metric tons.

Tinplate output for the quarter is estimated at 580,000 metric tons, 68 pct of the corresponding 1934-38 average.

Government-owned tin stocks in the United States and total stocks in Great Britain are estimated at 100,000 metric tons altogether, virtually identical with the figures for preceding periods.

For news of third quarter pig tin quotas, see p. 104.

Tin allocations by the Combined Tin Committee for the first half of 1946 total 27,776 metric tons, including 9000 to the United States, 7100 to France, 3202 to United Nations Relief and Rehabilitation Administration, 2570 to Canada, 1600 to India, 800 to Sweden and 600 to the Netherlands.

The bulletin states that in April Bolivian tin production was 2371 metric tons, compared with 3085 in March; that Malayan production was 1568 metric tons in March and that for the same month Nigerian production was 676 metric tons, compared with 1593 in February.

Monthly Average Prices

New York

• • • **The average prices of the major nonferrous metals in June, based on quotations appearing in The Iron Age, were as follows:**

	Cents Per Lb.
Electrolytic copper, Conn. Valley	14.28
Lake copper, Conn. Valley	14.28
Straits tin, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.65
Lead, St. Louis	8.03
Lead, New York	8.18

Tin Data Filing

Washington

• • • **The Combined Tin** Committee is gathering data preliminary to making interim allocations for the second half of 1946. All member countries and all countries requesting allocations of tin, it was announced, will be required to supply pertinent information on stocks, consumption and forward requirements on the committee's form TC 75 by the early part of August. All countries wishing to procure in excess of 50 gross tons of pig tin in a half year also are now required to file TC 75 with the committee through appropriate channels.

Nonferrous Ceilings Up

London

• • • **To bring selling** prices of copper, lead and zinc in the United Kingdom more closely into line with current purchase costs, maximum prices have been increased as follows: Copper by $53.76 per ton, copper rod by $56 per ton, lead, zinc, and zinc sheets by $44 per ton, zinc oxide by $38.08 per ton.

Western Metal Mines Wage Contracts Off

Salt Lake City

• • • **Utah's nonferrous** mining and smelting industry no sooner got its five month strike settled than it was kicked into another spasm of uncertainty by the demise of OPA and the Premium Price Plan. First response of lead and zinc was to move up 1.25¢ to 9.50¢ per pound quoted price. But this is far below actual price, ceiling plus premium, which producers in this area have been receiving. Assuming the Premium Price Plan is not restored, and without substantial further increases in the free market price, most of the lead and zinc producers will be forced to close down.

The wage settlement recently reached has been unsettled again. Contracts already signed permit operators to reopen bargaining on wages in the event the premium plan is discarded or the price they receive for metals is reduced below the former OPA ceiling price plus premiums. Signing of other contracts is being held up pending developments. Deep mines have been on vacation this past week and it is uncertain how many will resume operations Monday. An official of one major lead-zinc producing company reported that most of the industry in this area would have to have 12¢ lead, 16¢ to 17¢ zinc and 90¢ silver to pay the recently agreed pay increases and keep in the profit column.

Utah Copper, principal copper producer of the area and one of the largest producers of the other nonferrous metals, is not adversely affected by death of the Premium Price Plan, since it was operating without premiums and any increase in the free market price will raise its margins of profit. Despite the shock of a transfer from the ceiling price and subsidy system to a free market, most mine operators are inclined to welcome the change, since they recognize that the shock will be no greater now than later on and very few of them want to go on indefinitely collecting part of their revenue from the taxpayers and part from consumers.

Nonferrous Metals Prices
cents per lb

	July 3	July 4	July 5	July 6	July 8	July 9
Copper, electro., Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Copper, Lake, Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Tin, Straits, New York	52.00	52.00	52.00	....	52.00	52.00
Zinc, East St. Louis	9.50	9.50	9.50	9.50	9.50	9.50
Lead, St. Louis	9.35	9.35	9.35	9.35	9.35	9.35

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	$30.00
Cadmium, del'd	90.00
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Copper, electro, Conn. Valley	14.375
Copper, electro, New York	14.125
Copper, lake, Conn. Valley	14.375
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$ 2.25
Iridium, dollars per troy oz.	$110.00
Lead, St. Louis	9.35
Lead, New York	9.50
Magnesium, 99.9 + %, carlots	20.50
Magnesium, 12-in. sticks, carlots	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$100 to $102
Nickel, electro, f.o.b. refinery	35.00
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$70.00
Silver, New York, cents per oz.	——
Tin, Straits, New York	52.00
Zinc, East St. Louis	9.50
Zinc, New York	9.94
Zirconium copper, 6 pct Zr, per lb contained Zr	$ 6.00

Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2)	11.25 to 11.75
Aluminum, deoxidizing Nos. 2, 3, 4	10.00 to 11.50
Brass Ingot	
85-5-5-5 (No. 115)	15.50
88-10-2 (No. 215)	18.75
80-10-10 (No. 305)	18.25
No. 1 Yellow (No. 405)	12.50

Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded shapes	Rods	Sheets
Copper	25.66	....	25.81
Copper, H.R.	....	22.16	....
Copper drawn	....	23.16	....
Low brass, 80%	....	24.35	24.66
High brass	....	....	24.38
Red brass, 85%	....	24.67	24.98
Naval brass	23.84	22.59	28.53
Brass, free cut	....	18.53	....
Commercial, bronze	....	25.50	25.81
Manganese bronze	27.45	25.95	32.03
Phosphor bronze, A, B, 5%	....	43.68	43.43
Muntz metal	23.59	22.34	26.78
Everdur, Herculoy, Olympic or equal	....	29.82	30.88
Nickel silver, 5%	....	34.44	32.38
Architectural bronze	22.50	....	....

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢, 52S-O, 67¢ 24S-T, 71¢: base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.3¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb and over.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 27.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢ 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

(Continued, See Next Column)

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb or more, 46¢ a lb; 25 to 90 lb, 56¢; less than 25 lb, 66¢.

NONFERROUS SCRAP METAL QUOTATIONS

†(OPA basic maximum prices, cents per lb, f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)

Copper, Copper Base Alloys

OPA Group 1†

No. 1 wire, No. 1 heavy copper	11.50
No. 1 tinned copper wire, No. 1 tinned heavy copper	11.50
No. 2 wire, mixed heavy copper	10.50
Copper tuyeres	10.50
Light copper	9.50
Copper borings, No. 1	11.50
No. 2 copper borings	10.50
Lead covered copper wire, cable	....*
Lead covered telephone, power cable	....*
Insulated copper	....*

OPA Group 2†

Bell metal	17.25
High grade bronze gears	15.00
High grade bronze solids	....*
Low lead bronze borings	....*
Babbitt lined brass bushings	14.75
High lead bronze solids	....*
High lead bronze borings	....*
Red trolley wheels	12.50
Tinny (phosphor bronze) borings	12.25
Tinny (phosphor bronze) solids	12.25
Copper-nickel solids and borings	11.00
Bronze paper mill wire cloth	11.25
Aluminum bronze solids	10.75
Soft red brass (No. 1 composition)	10.75
Soft red brass borings (No. 1)	10.75*
Gilding metal turnings	10.25
Contaminated gilded metal solids	10.25
Unlined standard red car boxes	10.00
Lined standard red car boxes	9.50
Cocks and faucets	9.50
Mixed brass screens	9.50
Red brass breakage	9.25
Old nickel silver solids	7.60
Old nickel silver borings	7.50
Copper lead solids, borings	6.75
Yellow brass castings	7.50
Automobile radiators	8.75
Zincy bronze solids, borings	9.75

OPA Group 3†

Fired rifle shells	9.50
Brass pipe	8.75
Old rolled brass	8.25
Admiralty condenser tubes	8.75
Muntz metal condenser tubes	8.25
Plated brass sheet, pipe reflectors	7.75
Manganese bronze solids	8.00[1]
Manganese bronze solids	7.00[2]
Manganese bronze borings	7.25

OPA Group 4†

Refinery brass	6.00*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 pct. [2] Lead content 0.41 to 1.00 pct.

Brass Mill Scrap†

Briquetted cartridge brass turnings	10.375
Cartridge brass turnings, loose	9.625
Loose yellow brass trimmings	9.625

Aluminum

Plant scrap, segregated

2S solids	8.00 to 8.50
Dural alloys, solids 14, 17, 18, 24S, 25S	4.25 to 4.50
turnings, dry basis	1.50 to 1.75
Low copper, alloys 51, 52, 61, 63S solids	7.00 to 8.00
turnings, dry basis	5.00 to 6.50

Plant scrap, mixed

Solids	4.25 to 4.50
Turnings, dry basis	1.50 to 1.75

Obsolete scrap

Pure cable	6.50 to 7.50
Old sheet and utensils	5.00 to 5.50
Old castings and forgings	5.00 to 5.50
Pistons, free of struts	4.00 to 4.50
Pistons, with struts	2.50 to 3.00
Old alloy sheet	2.00 to 2.50

Magnesium*

Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	1.50

Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

*Nominal.

Zinc

New zinc clippings, trimmings	6.50
Engravers, lithographers plates	6.50
Old zinc scrap	4.75
Unsweated zinc dross	5.00
Die cast slab	4.50
New die cast scrap	4.45
Radiator grilles, old and new	3.50
Old die cast scrap	3.00

Lead

Deduct 1.40¢ a lb from refined metal basing point prices for soft and hard lead including cable, for f.o.b. point of shipment price.

Soft lead scrap	6.50

Nickel

Ni content 98+%, Cu under ½%, 23¢ per lb; 90 to 98% Ni, 23¢ per lb contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	29.75
Electrodeposited	23.47
Rolled, oval, straight	23.97
Curved, 18 in. or longer	23.97
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	27.25
Zinc, cast, 99.99, 15 in. or longer	16¼
Nickel, 99 pct plus, frt allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 100 oz. lots, per oz.	80¾

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls	34.00
Copper sulphate, 99.5, crystals, bbls	7.75
Nickel salts, single, 425 lb bbls, frt allowed	13.50
Silver cyanide, 100 oz lots, per oz.	0.655
Sodium cyanide, 96 pct, domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt allowed	6.35

SCRAP

New Business at Standstill as Prices Hold

New York

• • • **The scrap industry** is continuing to hold the line on prices as dealers hold on to inventories in their yards. New business is at a virtual standstill while shipments on old contracts are moving slowly.

The main reason for the lack of price changes is that mills are apparently maintaining a strong united stand against any changes. Many dealers are seeking to get

For further scrap news, p. 102.

mills to accept shipments on a consignment, or adjustable price, basis. These efforts are meeting with failure.

While many dealers believe that OPA will not be revived, they feel the possibility can not be discounted because of the confusion a retroactive change would involve. Indications are that mill inventories have not reached a critical stage; and most observers believe there will be no break in prices until inventories do reach that point.

•

PITTSBURGH—Prices are still holding at the OPA levels in this area but there is considerable doubt as to how long the calm will last. Both mills and dealers give lip service to the "Hold the line" slogan but observers feel that it has not yet been put to the test. That test will come, they state, when a mill or foundry is forced to curtail operations due to a scrap shortage. Currently, as in the recent past, overgrading is being used as a method of beating price ceilings. Many dealers are heavily engaged in the salvage business now and are not too worried about their scrap shipments. Mill inventories are not critical but inbound shipments are down sharply. Dealer billings are running about 50 pct of the war time rate. Production scrap is moving slowly, because many plants have closed for vacations ranging up to 2 weeks.

•

CHICAGO—Small amounts of scrap continue to move at the old OPA ceiling price. There is very little activity on new contracts. The mills appear determined to hold the line at the old price. Most of the scrap which moved during the last week was loaded and in the car prior to the end of OPA control. The scrap industry as a whole is marking time and not showing too much interest in new offerings. Bids being submitted by the dealers on new scrap lists carry two prices; one is the old ceiling price, the other is $1.25 above the old ceiling. The split bidding was done on railroad scrap and at the moment the railroads are in a quandary as the delivered price will still be retroactive should Congress insert new legislative control. No contracts have been closed as yet.

•

PHILADELPHIA—A small amount of steel scrap is moving in this area at ceiling prices on old contracts. Mills here are refusing to give any consideration to new contracts at higher prices pending further clarification of the OPA situation. Neither are they willing to order on an adjustable pricing basis. Fantastic prices are mentioned for cast scrap, one figure being $25 f.o.b. Philadelphia. One dealer estimates that it would have to go higher than that in order to compare with current pig iron prices. Apparently foundries that have been paying high freight charges for cast are willing to pay the same delivered figure in the absence of OPA.

•

DETROIT—Scrap brokers and dealers here are marking time waiting for definite action on OPA. Ceiling prices are reported as being maintained by all classes of buyers and any shipments made are based on ceiling price agreements. There is no indication that either buyers or sellers are ready to make a price move at this time. As was the case a week ago, shipments are on a very restricted basis.

•

BOSTON—Brokers and many yards took advantage of the uncertainty created by the abandonment of the OPA to take time out for vacation, and have been slow in resuming operations due to the continued tightness of material. Only one instance of price hiking is reported. A yard bought turnings at $1 a ton above the OPA ceiling. At last accounts it had not resold the turnings. However, upgrading is common practice and steel mills are less stringent about scrap analysis. Movement of bundling scrap is an outstanding feature.

•

NEW YORK—Brokers here report new business at a standstill, with old business moving indifferently. Prices are holding at the OPA levels as both sides play a cat and mouse game. Attempts are being made to persuade mills to accept scrap on a consignment basis subject to later negotiation, but they are meeting an apparently solid wall of refusals.

•

BUFFALO—Until OPA is resurrected or decently buried, new business in scrap is nonexistent here. Consequently price lists are purely nominal. One or two instances of foundries offering to pay "over ceiling" for cast grades have been reported, but dealers passed up the opportunity to get an extra dollar or two on the ground that prices might jump as much as $5 a ton in a free market. Some shipments are being made on old contracts, but the volume is only a trickle compared with what should be moving at this season. Steel mills are stepping up iron production to fill the scrap gap. Bethlehem recently added the sixth blast furnace at Lackawanna and Republic blew in its second unit yesterday (Wednesday). About 5000 tons of heavy melting arrived from New York by canal late last week for local consumers and 5000 tons is due next week by lake from Duluth. Regarding the July 1 boost in freight rates, rail spokesmen assert the 11 pct increase applies only to interstate shipments and that intrastate rates are not affected.

•

ST. LOUIS—The trade in this area continues to hold the price line since the termination of the OPA, but at the same time they are holding their inventories of material waiting to see what finally happens to price control. The result is that shipments have dwindled to almost nothing. Mills in the district are comfortably situated as to their inventories and will not pay more until they must do so. Missouri, Kansas, Texas and St. Louis Southwestern offer lists of 12 and seven carloads respectively, but dealers are puzzled as to what bids to make in view of the confused situation.

•

CINCINNATI—While there was a small amount of trade because foundries here are closed during the week, iron and steel scrap interests indicate that there is no relative change in the market. Expiration of OPA has not changed the price situation in this area, and most brokers and dealers are waiting to see what Washington will do next. Scrap is scarce and there is virtually no production scrap coming into the market. What dealers have been able to obtain has gone immediately on contracts.

•

CLEVELAND—There has been little change in the scrap market here as buyers and brokers await official word on the fate of OPA. There have been no sales at prices in excess of OPA ceilings and the movement of scrap is almost at a standstill. Yard dealers incoming shipments are at the lowest point in years and some major consumers report they may soon be forced to take off some open hearth capacity.

•

BIRMINGHAM—The few scrap transactions taking place in this market are on an OPA basis. If a price increase results, either through a new OPA setup or by its permanent termination, material shipped will be billed at the price in effect on the day shipment is made, according to all present indications. No increase will be made retroactive. Brokers are extremely cautious in making commitments until the whole price situation clears up.

•

TORONTO—While the big steel consumers continue to deplete scrap stockpiles, dealers report no improvement in receipts, with incoming materials sufficient only to take care of about 50 pct of requirements.

IRON AND STEEL SCRAP PRICES

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used they indicate the former ceiling price to which must be added brokerage fee and adjusted freight.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bdld. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
Hvy. break cast.	16.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos. bil. crops	25.00*
Low phos.	22.50*
RR. malleable	22.00*

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut bolsters & side frames	22.25*
Standard stl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Agricul. malleable	22.00*
RR. malleable	22.00*
No. 1 mach. cast.	20.00*
Rails 2 ft. and under	22.25*
No. 1 agricul. cast.	20.00*
Hvy. breakable cast.	16.50*
RR. grate bars	15.25*
Cast iron brake shoes	15.25*
Stove plate	19.00*
Clean auto cast.	20.00*
Cast iron carwheels	20.00*

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Scrap rails	21.00*

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	$15.05*
No. 2 hvy. melting	15.05*
Nos. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shovelings	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast, chem. bor.	$13.06 to 14.15*
Machinery Cast.	20.00*
Breakable cast.	16.50*
Stove plate	19.00*

DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*
Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	20.00*
Charging box cast.	19.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Automotive cast.	20.00*

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Cast, charging box	19.00*
Hvy. axle forge turn.	23.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

ST. LOUIS

Per gross ton delivered to consumer:

Heavy melting	$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut.	$18.50 to 19.00
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 mach'ery cast	20.00*
Breakable cast.	16.50*

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast	20.00*
Stove plate	19.00*
Steel axles	18.50*
Scrap rails	18.50
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00
Rails 3 ft. & under	21.00*
Cast iron carwheels	17.50 to 18.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shovel. turn.	17.00*
Cast iron borings	16.00*

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Charging box cast	19.00*
Stove plate	19.00*
Clean auto cast	20.00*
Unstrip. motor blks.	17.50*
Cl'n chem. cast bor.	14.33*

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	14.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 busheling	19.25*

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shovel.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

SAN FRANCISCO

Per gross ton delivered to consumer:

RR. hvy. melting	$18.00*
No. 1 hvy. melting	17.00*
No. 2 hvy. melting	17.00*
No. 2 bales	$15.00 to 15.75
No. 3 bales	8.50 to 9.25
Mach. shop turn.	6.50 to 7.25
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast	19.00 to 21.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$17.00
No. 2 hvy. melting	17.00
No. 1 bales	$16.00 to 17.00
No. 2 bales	15.50 to 16.00
No. 3 bales	8.00 to 9.00
Mach. shop turn.	7.00
No. 1 cupola cast.	19.00 to 21.00

SEATTLE

Per gross ton delivered to consumer:

RR. hvy. melting	$14.50*
No. 1 & No. 2 hvy. melting	14.50*
Elec. furn. 1 ft. und.	$14.00 to 15.00
No. 1 cupola cast.	20.00*

HAMILTON, ONT.

Per gross ton delivered to consumer:

Heavy melting	$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

Comparison of Prices . .

Advances over past week in **Heavy Type**; declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	July 9, 1946	July 2, 1946	June 4, 1946	July 10, 1945
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.70
Hot-rolled strip				
6-in. and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.25
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tinplate, electro (0.50 lb)	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.55	4.55	4.55	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.50	2.50	2.50	2.25
Cold-finished bars	3.10	3.10	3.10	2.65
Alloy bars	2.92	2.92	2.92	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302)	25.97	25.97	25.97	24.00
Wrought iron bars	4.76	4.76	4.76	4.40
Wire and Wire Products: (cents per pound)				
Bright wire	3.05	3.05	3.05	2.75
Wire nails	3.75	3.75	3.25	2.90
Rails: (dollars per net ton)				
Heavy rails	$43.39	$43.39	$43.39	$43.00
Light rails	49.18	49.18	49.18	45.00
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$39.00	$39.00	$39.00	$36.00
Sheet bars	38.00	38.00	38.00	36.00
Slabs, rerolling	39.00	39.00	39.00	36.00
Forging billets	47.00	47.00	47.00	42.00
Alloy blooms, billets, slabs	58.43	58.43	58.43	54.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.30	2.30	2.30	2.15
Skelp	2.05	2.05	2.05	1.90

Pig Iron*: (per gross ton)	July 9, 1946	July 2, 1946	June 4, 1946	July 10, 1945
No. 2 foundry, Phila.	$28.34	$28.34	$28.34	$26.84
No. 2, Valley furnace	26.50	26.50	26.50	25.00
No. 2, Southern, Cin'ti	28.94	26.94	26.94	25.44
No. 2, Birmingham	24.88	22.88	22.88	21.38
No. 2 foundry, Chicago†	26.50	26.50	26.50	25.00
Basic, del'd eastern Pa.	27.84	27.84	27.84	26.34
Basic, Valley furnace	26.00	26.00	26.00	24.50
Malleable, Chicago†	26.50	26.50	26.50	25.00
Malleable, Valley	26.50	26.50	26.50	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00
Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$8.75	$7.50	$7.50	$7.50
Foundry coke, prompt	9.85	9.00	9.00	9.00
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	14.375	14.375	14.375	12.00
Copper, Lake, Conn.	14.375	14.375	14.375	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	9.50	8.25	8.25	8.25
Lead, St. Louis	9.50	8.10	8.10	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.
‡ For carlots at seaboard.
*Subject to retroactive adjustment.

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
July 9, 1946	2.72115¢ per lb.	$26.45 per gross ton	$19.17 per gross ton
One week ago	2.72115¢ per lb.	$26.12 per gross ton	$19.17 per gross ton
One month ago	2.72115¢ per lb.	$26.12 per gross ton	$19.17 per gross ton
One year ago	2.44076¢ per lb.	$24.61 per gross ton	$19.17 per gross ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1946	2.72115¢ Apr. 2	2.54490¢ Jan. 1	$26.12 Mar. 19	$25.37 Jan. 1	$19.17	$19.17
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	$19.17 Jan. 2	$18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

NEOCETA BRUSHES

. . . keeps its stiffness in paints containing water . . .

"The Fascinating Story of Neoceta"—an intensely interesting booklet—is yours for the asking. Write to nearest Pittsburgh branch for your free copy.

WEARS LIKE PURE HOG BRISTLE

HOLDS JUST THE RIGHT AMOUNT OF PAINT

DOESN'T MAT OR FINGER

SPREADS PAINT READILY

Brush Division
PITTSBURGH
PLATE GLASS COMPANY

5 YEARS OF NATIONAL USE

Iron and Steel Prices...

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars[10]	DELIVERED TO Detroit	New York	Philadelphia
INGOTS															
Carbon, reroiling	($33.00 f. o. b. mill)														
Carbon, forging	$38	$38	$38	$38	$38	$38	$38								
Alloy	$48.69	$48.69				$48.69	(Bethlehem, Massillon, Canton, Coatesville—$48.69)								
BILLETS, BLOOMS, SLABS															
Carbon, reroiling	$39	$39	$39	$39	$39	$39	$39	$39				$51[14]	$41		
Carbon, forging billets	$47	$47	$47	$47	$47	$47	$47					$59[14]	$49		
Alloy	$58.43	$58.43				$58.43	(Bethlehem, Massillon, Canton—$58.43)						$60.59		
SHEET BARS	$38	$38		$38		$38	$38	$38	(Canton—$38)						
PIPE SKELP	2.05¢	2.05¢					2.05¢	2.05¢	(Coatesville—2.05¢)						
WIRE RODS[15]															
No. 5 to 9/32 in.	2.30¢	2.30¢		2.30¢	2.30¢	(Worcester—2.40¢)					2.55¢	2.80¢			
SHEETS															
Hot-rolled	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.525¢	2.425¢		2.975¢	2.525¢	2.685¢	2.615¢
Cold-rolled[1]	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275¢		3.375¢	3.275¢		3.925¢	3.375¢	3.615¢	3.635¢
Galvanized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.15¢	4.05¢		4.60¢		4.31¢	4.24¢
Enameling (20 gage)	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢		3.90¢	3.80¢		4.45¢	3.90¢	4.20¢	4.1 ¢
Enameling (10 Gage)	3.20¢	3.20¢	3.20¢	3.20¢			3.20¢		3.30¢	3.20¢		3.85¢	3.30¢	3.60¢	3.5 ¢
Long ternes[2]	4.05¢	4.05¢	4.05¢									4.80¢		4.45¢	4.41¢
STRIP															
Hot-rolled[3] 6 in. and under	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢		2.45¢			2.45¢		3.10¢	2.55¢	2.85¢	2.81¢
Hot-rolled[3] over 6 in.	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢		2.35¢			2.35¢		3.00¢	2.45¢	2.75¢	2.71¢
Cold-rolled[4]	3.05¢	3.15¢		3.05¢			3.05¢	(Worcester—3.25¢)					3.15¢	3.45¢	3.41¢
Cooperage stock	2.65¢	2.65¢			2.65¢		2.65¢							2.95¢	
TINPLATE															
Standard cokes, base box	$5.00	$5.00	$5.00		$5.10			$5.10	$5.10					$5.375	$5.301
Electro, box 0.25 lb	$4.35	$4.35	$4.35					$4.35							
Electro, box 0.50 lb	$4.50	$4.50	$4.50					$4.60	$4.60						
Electro, box 0.75 lb	$4.65		$4.65					$4.75	$4.75						
BLACKPLATE															
29 gage[5]	3.30¢	3.30¢	3.30¢					3.40¢	3.40¢					3.66¢	3.59¢
TERNES, MFG.															
Special coated, base box	$4.55	$4.55	$4.55					$4.95	$4.65						
BARS															
Carbon steel	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	(Duluth—2.80¢) (Provo, Utah—3.20¢)			2.85¢	3.15¢	2.60¢	2.84¢	2.86¢
Rail steel[6]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢					2.85¢	3.15¢			
Reinforcing (billet)[7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢			2.70¢	2.75¢	2.45¢	2.61¢	2.69¢
Reinforcing (rail)[7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.70¢	2.75¢	2.45¢		
Cold-finished[8]	3.10¢	3.10¢	3.10¢	3.10¢		3.10¢	(Detroit—3.15¢)				(Toledo—3.25¢)			3.44¢	3.46¢
Alloy, hot-rolled	2.92¢	2.92¢				2.92¢	2.92¢	(Bethlehem Massillon, Canton—2.92¢)					3.03¢		
Alloy, cold-drawn	3.62¢	3.62¢	3.62¢	3.62¢		3.62¢							3.73¢		
PLATE								(Coatesville and Claymont—2.50¢, Provo, Utah—3.20¢)							
Carbon steel[13]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢			2.85¢	3.05¢	2.72¢	2.71¢	2.558¢
Floor plates	3.75¢	3.75¢									4.10¢	4.40¢		4.15¢	4.15¢
Alloy	3.79¢	3.79¢			(Coatesville—3.79¢)						4.27¢	4.49¢		4.01¢	3.895¢
SHAPES															
Structural	2.35¢	2.35¢	2.35¢		2.35¢	2.35¢	(Bethlehem—2.35¢)				2.60¢	3.00¢		2.54¢	2.48¢
SPRING STEEL, C-R															
0.26 to 0.50 carbon	2.80¢			2.80¢			(Worcester—3.20¢)								
0.51 to 0.75 carbon	4.30¢			4.30¢			(Worcester—4.50¢)								
0.76 to 1.00 carbon	6.15¢			6.15¢			(Worcester—6.35¢)								
1.01 to 1.25 carbon	8.35¢			8.35¢			(Worcester—8.55¢)								
WIRE[9]															
Bright[12]	3.05¢	3.05¢		3.05¢	3.05¢		(Worcester—3.15¢)			(Duluth—3.10¢)		3.55¢		3.44¢	3.41¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.00¢	4.00¢		4.00¢			(Worcester—4.10¢)			(Trenton—4.25¢)		4.50¢		4.39¢	4.339¢
PILING															
Steel sheet	2.65¢	2.65¢				2.65¢						3.20¢		2.99¢	3.01¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.05	25.97	20.02	20.56	24.34	29.75
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi	27.05	25.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.95	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.46	30.30	23.80	24.34	34.62	56.26
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.95	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Newark, N. J., Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 8 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, O.)*

An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57½¢
High-carbon-chromium*	43¢
Oil hardening*	24¢
Special carbon*	22¢
Extra carbon*	18¢
Regular carbon*	14¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	3.90¢
Armature	4.25¢
Electrical	4.75¢
Motor	5.425¢
Dynamo	6.125¢
Transformer 72	6.625¢
Transformer 65	7.625¢
Transformer 58	8.125¢
Transformer 52	8.925¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., net ton	$43.39
Angle splice bars, 100 lb	2.85
(F.o.b. basing points)	*per net ton*
Light rails (from billets)	$49.18
Light rails (from rail steel)	49.18
	base per lb
Cut spikes	3.65¢
Screw spikes	5.55¢
Tie plate, steel	2.55¢
Tie plates, Pacific Coast	2.70¢
Track bolts	*4.75¢
Track bolts, heat treated, to railroads	*5.00¢
Track bolts, jobbers discount	63-5

*Plus an increase of 7 pct.

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.

SHELL STEEL

	per gross ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic openhearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are $2.00 higher; East Michigan, $3 higher.

Price Exceptions: Follansbee Steel Corp. permitted to sell at $13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of $52.00.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	21.00*	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.72	....
Inconel-clad		
10 pct, f.o.b. Coatesville	26.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

*Includes annealing and pickling.

WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	Pacific Coast Basing Points†
	base per keg	
Standard wire nails	$3.75	$4.25
Coated nails	3.75	4.25
Cut nails, carloads	4.85	....
	base per 100 lb	
Annealed fence wire	$3.50	$4.00
Annealed galv. fence wire	3.85	4.35
	base column	
Woven wire fence*	72	90
Fence posts, carloads	74	91
Single loop bale ties††	72	97
Galvanized barbed wire**	79	89
Twisted barbless wire	79	89

*15½ gage and heavier. **On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

††Add 50c a ton.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$8.50	$17.00
15-lb coating I.C.	9.50	19.00
20-lb coating I.C.	10.00	20.00

ALLOY EXTRAS

Alloy Steel	Basic Openhearth		Electric Furnace	
	Bars and Bar-strip	Billets, Blooms and Slabs	Bars and Bar-strip	Billets, Blooms and Slabs
A 8600	0.676¢	$13.52	1.196¢	$23.92
A 8700	0.728	14.56	1.248	24.96
NE 9400	0.780	15.60	1.300	26.00
NE 9700	0.676	13.52	1.196	23.92
NE 9800	1.352	27.04	1.872	37.44
NE 9900	1.248	24.96	1.612	32.24

The extras shown are in addition to the base price of $2.92 per 100 lb on finished products and $58.43 per gross ton on semifinished steel, major basing points, as shown in table, opposite page, and are in cents per pound when applicable to bars and bar-strip and in dollars per gross ton when applicable to billets, blooms and slabs. When acid openhearth is specified and acceptable, add to basic openhearth alloy differential 0.27¢ per lb for bars and bar-strip and $5.14 per gross ton for billets, blooms and slabs. Alloy price increases are retroactive to Mar. 1.

WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills

(F.o.b. Pittsburgh only on wrought pipe) base price—$200.00 per net ton

Steel (buttweld)

	Black	Galv.
½-in.	60½	48
¾-in.	63½	52
1-in. to 3-in.	65½	54½

Wrought Iron (buttweld)

½-in.	17⅞	+4⅜
¾-in.	24¼	2⅝
1-in. and 1¼-in.	28⅝	9⅛
1½-in.	33	11⅞
2-in.	32⅜	11⅜

Steel (lapweld)

2-in.	58	46½
2½-in. and 3-in.	61	49½
3½-in. to 6-in.	63	51½

Wrought Iron (lapweld)

2-in.	24⅞	4⅞
2½-in. to 3½-in.	25⅞	7½
4-in.	28⅛	11⅜
4½-in. to 8-in.	27	10¼

Steel (butt, extra strong, plain ends)

½-in.	58½	47½
¾-in.	62½	51½
1-in. to 3-in.	64	54

Wrought Iron (same as above)

½-in.	18⅞	+1⅝
¾-in.	25⅝	4¾
1-in. to 2-in.	33	13

Steel (lap, extra strong, plain ends)

2-in.	56	45½
2½-in. and 3-in.	60	49½
3½-in. to 6-in.	63½	53

Wrought Iron (same as above)

2-in.	28½	8⅝
2½-in. to 4-in.	34	16¼
4½-in. to 6-in.	32⅜	14⅝

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or $2 a ton higher on all buttweld.

BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless Cold-Drawn	Seamless Hot-Rolled	Lap-weld, Hot-Rolled
2 in. O.D. 13 B.W.G.	16.52	13.90	13.20
2½ in. O.D. 12 B.W.G.	22.21	18.70	17.67
3 in. O.D. 12 B.W.G.	24.71	20.79	19.56
3½ in. O.D. 11 B.W.G.	31.18	26.25	24.68
4 in. O.D. 10 B.W.G.	38.68	32.56	30.55

(Extras for less carload quantities)

40,000 lb or ft and over	Base
30,000 lb or ft to 39,999 lb or ft.	5 pct
20,000 lb or ft to 29,999 lb or ft.	10 pct
10,000 lb or ft to 19,999 lb or ft.	20 pct
5,000 lb or ft to 9,999 lb or ft.	30 pct
2,000 lb or ft to 4,999 lb or ft.	45 pct
Under 2,000 lb or ft.	65 pct

CAST IRON WATER PIPE

Subject to retroactive adjustment for pig iron.

	Per net ton
6-in. to 24-in., del'd Chicago	$66.33
6-in. to 24-in., del'd New York	65.60
6-in. to 24-in., Birmingham	57.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle for all rail shipment; rail and water shipment less	80.40

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 7 pct applies to all listings.

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots

	Percent Off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all lengths	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 in. through 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full keg lots, 10 pct additional discount.

Stove Bolts

	Consumer
Packages, nuts loose	71 and 10
In packages	71
In bulk	80

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets
(½ in. and larger)

	Base per 100 Lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.75

Small Rivets
(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws	Percent Off List Consumer
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Effective CaF_2 Content:	Base price per short ton
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports*)

	Per Gross Ton
Old range, bessemer	$5.45
Old range, non-bessemer	5.30
Mesaba, bessemer	5.20
Mesaba, non-bessemer	5.05
High phosphorus	5.05

Prices are for ore shipped on and after June 24, 1946, and for ore covered by adjustable pricing agreements authorized by Order No. 8, RMPR 113.

These prices do not reflect the recent ICC increase in freight rates.

METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, cents per lb, ton lots.

Brass, minus 100 mesh	18.5¢ to 20.25¢
Copper, electrolytic, 150 and 200 mesh	21½¢ to 23½¢
Copper, reduced, 150 and 200 mesh	20½¢ to 25½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe	11¢ to 16¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	4¢
Iron, hydrogen reduced, 300 mesh and finer, 98½ + % Fe, drum lots	63¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	27¢ to 42¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	31¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢
Aluminum, 100 and 200 mesh	*25¢
Antimony, 100 mesh	30¢
Cadmium, 100 mesh	$1.40
Chromium, 100 mesh and finer	$1.25
Lead, 100, 200 & 300 mesh	11½ to 15¢
Manganese, minus 325 mesh and coarser	44¢ to 61¢
Nickel, 150 mesh	51½¢
Silicon, minus 325 mesh and coarser	26¢ to 55¢
Solder powder, 100 mesh	8½¢ plus metal
Tin, 100 mesh	58¾¢
Tungsten metal powder, 98%-99%, any quantity, per lb	$2.60
Molybdenum powder, 99%, in 200-lb kegs, f.o.b. York, Pa., per lb	$2.60
Under 100 lb	$3.00

*Freight allowed east of Mississippi.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$8.75
Connellsville, Pa., hand drawn	9.35
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.95
Connellsville, Pa.	9.85
Foundry, Byproduct	
Chicago, del'd	15.10
Chicago, f.o.b.	14.35
New England, del'd	16.00
Kearny, N. J., f.o.b.	14.40
Philadelphia, del'd	14.63
Buffalo, del'd	14.75
Portsmouth, Ohio, f.o.b.	12.85
Painesville, Ohio, f.o.b.	13.50
Erie, del'd	14.50
Cleveland, del'd	14.55
Cincinnati, del'd	14.60
St. Louis, del'd	15.10†
Birmingham, del'd	12.25

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of $15.60 in the St. Louis Mo., and East St. Louis, Ill., switching districts.

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Per 1000
Super-duty brick, St. Louis	$76.05
First quality, Pa., Md., Ky., Mo., Ill., Ohio	60.40
First quality, New Jersey	65.90
Sec. quality, Pa., Md., Ky., Mo., Ill.	54.80
Sec. quality, New Jersey	57.70
Sec. quality, Ohio	52.95
Ground fire clay, net ton, bulk	8.95

Silica Brick

Pennsylvania and Birmingham	$60.40
Chicago District	69.30
Silica cement, net ton (Eastern)	10.60

Chrome Brick	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$54.00

Magnesite Brick

Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$43.48
Domestic, f.o.b. Chewelah, Wash. in bulk	22.00
in sacks	26.00

Clinker (dead burned) dolomite, per ton East, $9.30; Midwest, add 10¢; Mo. Valley, add 20¢.

WAREHOUSE PRICES

Delivered metropolitan areas per 100 lb.

Cities	SHEETS			STRIP			Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
				Hot-Rolled										
	Hot-Rolled (10 gage)	Cold-Rolled	Galvanized (24 gage)	6 in. and Under	Over 6 in.	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A-8617-20	Hot-Rolled, A-8742-50 Ann.	Cold-Drawn, A-8617-20	Cold-Drawn, A-8742-50 Ann.
**Philadelphia	$3.743	$5.097	$5.218a	$4.272	$4.172	$5.022	$3.855	$3.916	$4.072	$4.522	$6.016	$7.116	$7.372	$8.422
New York	3.815	4.838[1]	5.46	4.324	4.224	5.024	4.018	4.008	4.103	4.553	6.058	7.158	7.403	8.453
Boston	3.999	4.969[3]	5.674	4.456	4.356	4.965	4.162	4.162	4.294	4.594	6.212	7.312	7.444	8.494
Baltimore	3.619	5.077	5.344	4.252	4.152	....	3.844	4.009	4.052	4.502	6.109	7.209	7.352	8.402
Norfolk	3.996	....	5.821	4.515	4.415	....	4.221	4.252	4.315	4.615	....	....	....	....
Chicago	3.475	4.425	5.581	3.95	3.85	4.90[6]	3.80	3.80	3.75	4.20	5.80	6.90	....	8.00
Milwaukee	3.612	4.562[1]	5.537	4.087	4.077	5.037[6]	3.937	3.937	3.887	4.337	6.037	7.037	7.187	8.237
Cleveland	3.575	4.625	5.327	3.95	3.85	4.70[6]	3.65	3.838	3.60	4.20	6.006	7.106	6.95	8.00
Buffalo	3.575	4.625	5.20	4.169	4.069	4.919[6]	3.88	3.65	3.60	4.20	5.80	6.90	6.95	8.00
Detroit	3.675	4.725	5.45	4.05	3.95	....	3.859	3.911	3.70	4.25	6.13	7.23	7.259	8.309
Cincinnati	3.65	4.70[1]	5.275	4.025	3.925	4.961	3.911	3.941	3.861	4.461	6.15	7.25	7.311	8.361
St. Louis	3.622	4.572[1]	5.581	4.097	3.997	5.181[6]	3.947	3.947	3.897	4.481	6.181	....	7.331	....
Pittsburgh	3.575	4.625	5.20	3.95	3.85	4.70	3.65	3.65	3.60	4.20	5.80	6.90	6.95	7.95
St. Paul	3.797	4.747	5.635	4.272	4.172	5.352	4.122	4.122	4.072	4.811	6.202	6.302	7.352	7.402
Omaha	4.018	5.668	5.965	4.493	4.393	....	4.343	4.343	4.293	4.893	....	....	....	....
Indianapolis	3.745	4.795	5.37	4.12	4.02	4.99	3.88	3.88	3.83	4.43	6.13	....	7.28	....
Birmingham	3.675	....	5.20	4.05	3.95	....	3.80	3.80	3.75	4.903	....	....	....	....
Memphis	4.19	4.885	5.715	4.565	4.465	....	4.315	4.315	4.265	4.78	....	....	....	....
New Orleans	4.283*	5.304	5.808	4.658	4.558	....	4.408	4.408*	4.358*	5.079	....	....	....	....
Houston	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Los Angeles	4.85	6.60[1]	6.55	5.30	5.20	....	4.80	4.70	4.65	6.03	....	....	....	....
San Francisco	4.12	6.87	6.35	4.60	4.50	4.15	4.15	4.15	4.30	5.78	....	....	....	....
Seattle	4.87[5]	7.27[2]	6.40	4.60	4.50	....	5.00[5]	4.70[5]	4.60[5]	6.23	....	....	....	....
Portland	4.87[4]	6.82[2]	6.20	5.10	5.00	....	5.00[4]	4.70[4]	4.70[4]	5.98	8.15	....	9.20	....
Salt Lake City	4.75	....	6.62[7]	5.88	5.78	....	5.23[7]	5.23[7]	5.13	6.35	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars, 1500 lb base.

NE ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 450 to 3749 lb; (4) 300 to 4999 lb; (5) 300 to 10,000 lb; (6) 2000 lb and over; (7) 3500 lb and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

* Add 0.271¢ for sizes not rolled in Birmingham.

** City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

PIG IRON PRICES

Per gross ton, subject to retroactive adjustment.

These prices do not reflect the recent ICC increase in freight rates. New prices will be published as soon as various state commissions approve the increases.

BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	27.00	27.50	28.00	28.50	.....
Birdsboro	27.00	27.50	28.00	28.50	32.00
Birmingham	25.50	26.88*	.....	27.50	.....
Buffalo	25.50	26.50	27.00	27.50	32.00
Chicago	26.00	26.50	26.50	27.00	.....
Cleveland	26.00	26.50	26.50	27.00	.....
Detroit	26.00	26.50	26.50	27.00	.....
Duluth	26.50	27.00	27.00	27.50	.....
Erie	26.00	26.50	27.00	27.50	.....
Everett	27.00	27.50	28.00	28.50	.....
Granite City	26.00	26.50	26.50	27.00	.....
Hamilton	26.00	26.50	26.50	.....	.....
Neville Island	26.00	26.50	26.50	27.00	.....
Provo	24.00	24.50	.....	.....	.....
Sharpsville	26.00	26.50	26.50	27.00	.....
Sparrows Point	27.00	27.50	.....	.....	.....
Steelton	27.00	.....	.....	.....	32.00
Swedeland	27.00	27.50	28.00	28.50	.....
Toledo	26.00	26.50	26.50	27.00	.....
Youngstown[1]	26.00	26.50	26.50	27.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	0.50	27.50	28.00	28.50	29.00	.....
Boston	Birdsboro-Steelton	4.02	.....	.....	.....	.....	36.02
Brooklyn	Bethlehem	2.50	29.50	30.00	30.50	31.00	.....
Brooklyn	Birdsboro	2.92	.....	.....	.....	.....	34.92
Canton	Clev, Ygstn, Sharpsvil.	1.39	27.39	27.89	27.89	28.39	.....
Canton	Buffalo	3.19	.....	.....	.....	.....	35.10
Cincinnati	Birmingham	4.06	29.56	30.94†	.....	.....	.....
Cincinnati	Hamilton	1.11	.....	.....	27.61	.....	.....
Cincinnati	Buffalo	4.40	.....	.....	.....	.....	36.40
Jersey City	Bethlehem	1.53	28.53	29.03	29.53	30.03	.....
Jersey City	Birdsboro	1.94	.....	.....	.....	.....	33.94
Los Angeles	Provo	4.95	28.95	29.45	.....	.....	.....
Los Angeles	Buffalo	15.41	.....	.....	.....	.....	47.41
Mansfield	Cleveland-Toledo	1.94	27.94	28.44	28.44	28.94	.....
Mansfield	Buffalo	3.36	.....	.....	.....	.....	35.38
Philadelphia	Swedeland	0.84	27.84	28.34	28.84	29.34	.....
Philadelphia	Birdsboro	1.24	.....	.....	.....	.....	33.24
San Francisco	Provo	4.95	28.95	29.45	.....	.....	.....
San Francisco	Buffalo	15.41	.....	.....	.....	.....	47.41
Seattle	Provo	4.95	28.95	29.45	.....	.....	.....
Seattle	Buffalo	15.41	.....	.....	.....	.....	47.41
St. Louis	Granite City	0.50	26.50	27.00	27.00	27.50	.....
St. Louis	Buffalo	7.07	.....	.....	.....	.....	39.0

* $22.88 to $26.88.
† $26.94 to $30.94.

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, $33.00 and $34.00, respectively. Newberry Brand of Lake Superior charcoal iron $39.00 per g.t., f.o.b. furnace. Delivered to Chicago, $42.34. High phosphorus iron sells at Lyles, Tenn., at $28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorous content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$32.00; f.o.b. Buffalo—$33.25. Add $1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for prices of comparable analysis.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Less ton lots (packed)	148.50
F.o.b. Pittsburgh	139.50

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	6.05	6.30	6.60
Ton lots	6.65	7.55	8.55
Less ton lots	6.80	7.80	8.80

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$35.00	$36.00
Less ton	47.50	48.50
F.o.b. Pittsburgh, Chicago	40.00	

Manganese Metal

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed.

96-98% Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30
L.c.l. lots	32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.10 max. C, 0.06% P, 90% Mn	21.00	21.40	21.65
0.10% max. C	20.50	20.90	21.15
0.15% max. C	20.00	20.40	20.65
0.30% max. C	19.50	19.90	20.15
0.50% max. C	19.00	19.40	19.65
0.75% max. C, 7.00% max. Si	16.00	16.40	16.65

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.05
Ton lots	6.70
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet.	5.80
Ton lots	6.30
Less ton lots	6.55

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $51.25 f.o.b. Keokuk, Iowa; $48.00 f.o.b. Jackson, Ohio; $49.25 f.o.b. Niagara Falls. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.

	Eastern	Central	Western
96% Si, 2% Fe	13.10	13.55	16.50
97% Si, 1% Fe	13.45	13.90	16.80

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si.

	Eastern	Central	Western
Carload, bulk	3.60	3.75	3.90
Ton lots	4.05	4.55	4.60
Less ton lots	4.45	4.80	4.85

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
50% Si	7.05	7.50	7.65
75% Si	8.55	8.70	9.25
80-90% Si	9.50	9.65	10.15
90-95% Si	11.80	11.95	12.40

Ferrochrome (65-72% *Cr*, 2% *max. Si*)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00	23.40	24.00
0.10% C	22.50	22.90	23.50
0.15% C	22.00	22.40	23.00
0.20% C	21.50	21.90	22.50
0.50% C	21.00	21.40	22.00
1.00% C	20.50	20.90	21.50
2.00% C	19.50	19.90	20.50
66-71% Cr, 4-10% C	14.50	14.90	15.00
62-66% Cr, 5-7% C	15.05	15.45	15.55

Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	9.20	9.50	9.90
Ton lots	9.80	10.30	11.80
Less ton lots	10.10	10.60	12.10

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66.71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	15.60	16.00	16.10
Ton lots	16.65	17.30	18.50
Less ton lots	17.30	17.95	19.15

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	20.00	20.40	21.00
Ton lots	21.00	21.65	22.85
Less ton lots	22.00	22.65	23.85

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

Chromium—Copper

Contract price, cents per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.

Shot or ingot	45¢

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	13.00	13.50	15.55
Ton lots	14.50	15.25	17.40
Less ton lots	15.50	16.25	18.40

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	16.50	17.35	19.10
Less ton lots	17.00	17.85	19.60

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.35	$1.75	$4.25
Less ton lots	1.60	2.00	5.00

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

	Eastern	Central	Western
Ton lots	12.00	12.75	14.75
Less ton lots	12.50	13.25	15.25

Alloy 5: 50-56% Cr, 4-6% Mn, 13-50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	11.75	12.50	14.50
Less ton lots	12.25	13.00	15.00

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.

	Eastern	Central	Western
Ton lots	12.00	12.85	14.60
Less ton lots	12.50	13.35	15.10

Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed	$1.88
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.70
Crucible	$2.80
High speed steel (Primos)	$2.90
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2O_5	$1.10
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb.	
Ton lots	$2.25
Less ton lots	$2.30
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	95¢
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10%C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10%C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads	$142.50
Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equalled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, Electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carloads lots	14¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	4.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload	5.75¢
Ton lots	7.25¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	8.00¢
Ton lots	8.75¢
Less ton lots	9.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$2.10	$2.1125	$2.1445

Silcaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	25¢
Ton lots	26¢
Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	58¢
Ton lots	59¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	87.5¢
No. 6	60¢
No. 79	45¢
Bortram, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Costs Count IN THE AUTOMOTIVE INDUSTRY! - SO

CARBOLOY STANDARDS CEMENTED CARBIDE get the call!

Carboloy Tools Stay On the Job Longer in Continuous Production — Hold Close Tolerances — Produce Top-Quality Finish.

They watch costs with an "eagle-eye" in the highly competitive automotive industry. And that's why you'll find Carboloy Cemented Carbide "Standards" used in the production of virtually every mechanical part in the automobile. Carboloy "Standards" have earned this preference because of their superior stamina throughout long, continuous production runs—their high piece-output-per-tool—their ability to hold close tolerances, maintain their cutting edge longer between grinds, and produce the high quality finish required in today's motor cars.

In Every Industry, 60 to 80% of the Carbide Tool Needs Are Met By These 11 Standard Styles

Carboloy Standards are "master" styles, designed to handle most of your turning, facing and boring jobs. For special requirements, they may be quickly ground to the desired shape. They save stocking a large inventory of special tools, and let you tool up immediately on most jobs. Equally suitable for metals and non-metallics. And actually priced lower than ordinary tools in many sizes. Write today for Catalog GT-175R

CARBOLOY COMPANY, INC., 11153 E. 8 Mile Road, Detroit 32, Mich.

CHICAGO • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES • MILWAUKEE • PHILADELPHIA • PITTSBURGH • THOMASTON

STOCKED BY AUTHORIZED CARBOLOY CEMENTED CARBIDES DISTRIBUTORS IN 58 CITIES Coast To Coast

Standard CARBOLOY (TRADEMARK) CEMENTED CARBIDE TOOLS

DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MACPHERSON

Electroplated Engine Bearing Developed By Cleveland Graphit

Cleveland

• • • **An electroplated** heavy dut engine bearing which has been un der development at the Clevelan Graphite Bronze Co. for severa years, is now in production, mark ing the first time that precision au tomatic plating has been used in th sleeve bearing industry on a pro duction basis except on aircraf engine bearings.

The bearing, which is expected t play an important part in postwa automotive business, is designate as Clevite 77, and is intended pri marily for heavy duty applicatio in gasoline and diesel engines where loads exceed the capacities of previous types of bearings.

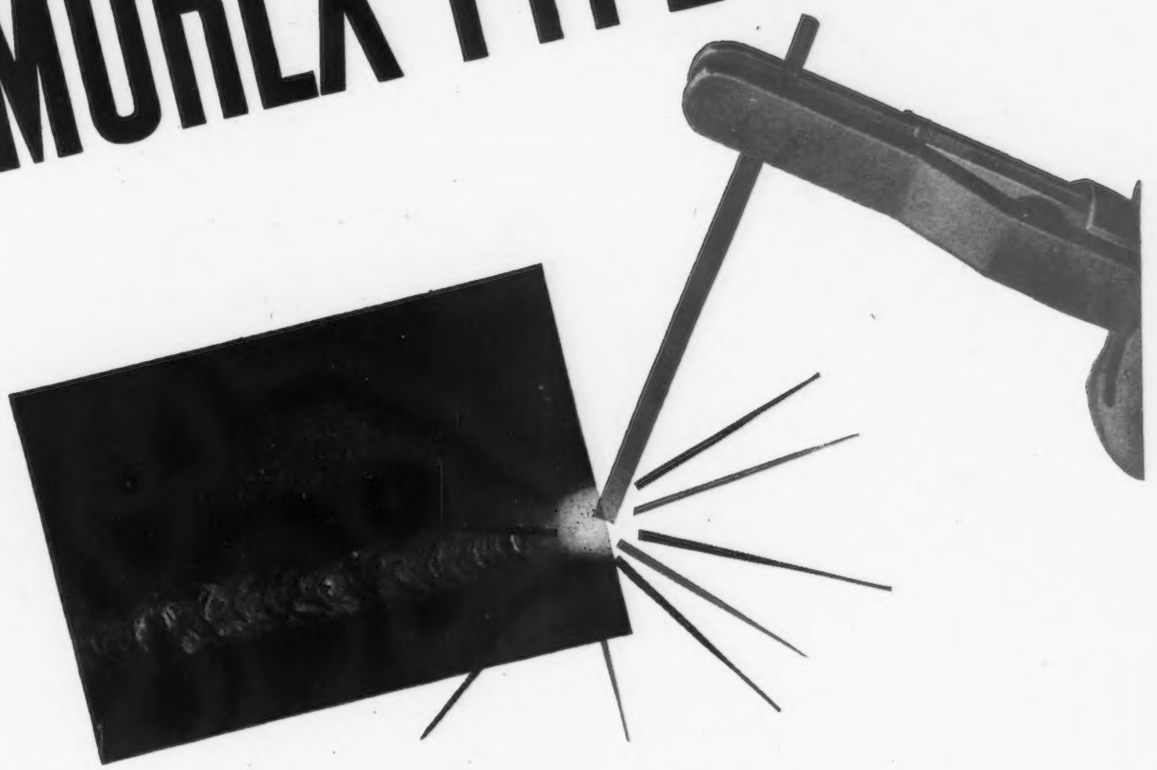
According to Cleveland Graphite Bronze officials, the new bearing is an aircraft-type product, consisting of a steel back, an intermediate layer of a special copper-lead alloy, and a thin surface layer of a soft bearing alloy, following the construction of many aircraft engine bearings, composed of three metals which are co-deposited by high-precision automatic electroplating equipment.

The plated layer, about 1/1000 in. thick, gives a bearing surface of high load carrying capacity and a good fatigue life and also aids the bearing to break in properly.

Max M. Roensch, chief engineer, said the original research which resulted in developing Clevite 77 was directed by John V. O. Palm, who retired last year after many years as head of Graphites' Engineering Div.

Production of the Clevite 77 starts with coils of steel strip which unroll and pass continuously through electric furnaces which preheat the steel and apply the copper-lead layer. After cooling, the fused strip is cut in short lengths which are formed and machined. The bearings are carried on an underground conveyor into the plating building and placed in specially designed containers which move automatically in and out of a series of tanks where the final layer is applied by electroplating. Electrical controls allow the plated layer to be applied at a thickness of 1/1000 in. with a tolerance of only 1/10,000 in. plus or minus.

MUREX TYPE HTS



The Right Electrode for Hard-to-Weld Steels

Developed primarily to prevent underbead cracking when welding high tensile steels without preheating, Murex Type HTS is an all-position rod providing weld metal of 70,000 psi tensile strength with ductility and X-ray soundness equal to that of welds made with downhand electrodes.

Because of its moderate penetration and low pick-up of undesirable elements from the parent metal, it is particularly useful in welding high-carbon, high-sulphur and other difficult-to-weld steels.

The complete facilities of our welding laboratory are available to help users of Murex electrodes achieve superior welds at lower costs. More detailed information on Type HTS or other widely-used Murex rods is available on request.

METAL & THERMIT CORPORATION

120 Broadway, New York 5, N. Y.

Albany • Chicago • Pittsburgh • So. San Francisco • Toronto

MUREX ELECTRODES

Predicts Steel Output Ample for Peak Motor Car Production in 1948

New York

• • • **With steel** production nearing wartime peaks, automobile makers and other users will be able to get enough steel for anticipated needs if the industry is able to continue full scale operations without interruption in the coming months, Walter S. Tower, president of American Iron & Steel Institute, said in a recent statement.

Walter S. Tower

Present capacity of the industry of approximately 90,000,000 tons of ingots annually is nearly 50 pct greater than the maximum production attained before the war, Mr. Tower pointed out.

"A responsible executive in the automobile industry has stated that the output of passenger cars in 1946 will approximate 2,000,000 units, and reach a peak of 5,000,000 passenger cars and 1,500,000 trucks in 1948," Mr. Tower said.

"The amount of steel needed to produce this total of 6,500,000 passenger cars and trucks would be about 11,500,000 tons, or only 18 pct of the present annual capacity of finished steel.

"That would represent a smaller proportion of present greatly expanded capacity than in the prewar period. In 1937, for instance, the automotive industry received 20 pct of steel shipments.

"Therefore, as soon as the effect of normal production can make itself felt, the amount of steel required for the automotive industry's anticipated output can be provided and still leave for other classes of consumers a greater tonnage of steel and a larger share of the total shipments than before the war.

"Sheet and strip steel will continue to be the chief steel products required by automobile and truck producers, other products being bars, forging billets, plates, wire and wire products.

"The average car requires about 2715 lb of hot and cold-rolled

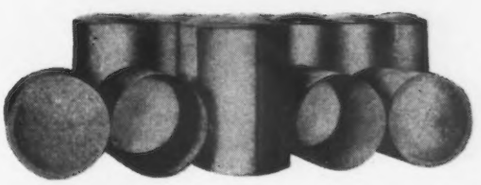
STEEL PLATE FABRICATION

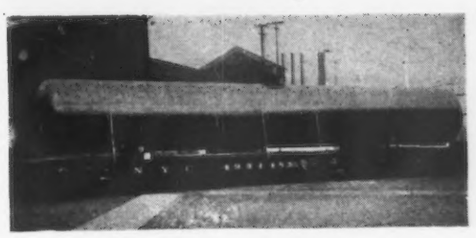
for the Iron & Steel Industry

General American Equipment has a long record of satisfactory service to many outstanding steel mills. Much of this equipment was precision fabricated from specifications submitted by steel mill engineers, and some was designed, fabricated and installed by General American to meet performance requirements.

General American has excellent X-ray facilities, heat treating and stress relieving furnaces, and experience in fabricating equipment of carbon, stainless, alloy steels, Everdur, Hastelloy, Monel and clad materials.

Use this experience in building your next plate fabricated installation.



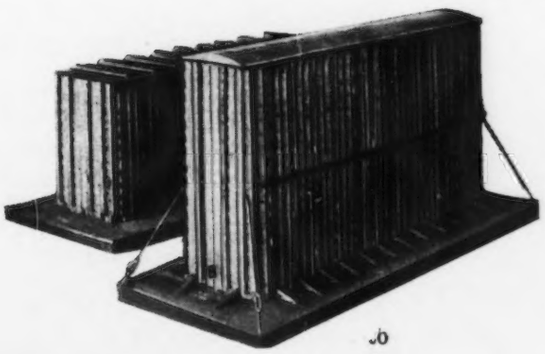


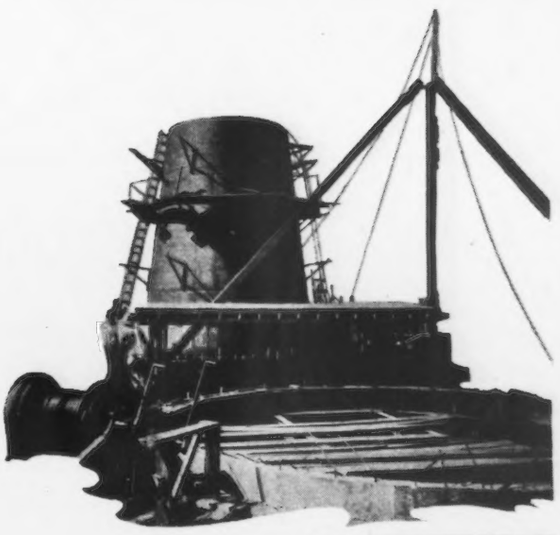
OTHER GENERAL AMERICAN EQUIPMENT

Annealing Covers — *Steel Stacks*
Bases—Welded — *Weldments*
Bins — *Accumulator Tanks—High Pressure*
Charging Boxes — *Large Diameter Pipe and Mains*
Pressure Vessels — *Pots—Tin or Galvanizing*

Steel Plate Fabrication

Storage Tanks—oil—water—acid—propane—butane





General American

TRANSPORTATION CORPORATION

process equipment • steel and alloy plate fabrication

SALES OFFICE:
519a Graybar Bldg., New York 17, N. Y.
WORKS: Sharon, Pa.; East Chicago, Ind.

GATX GENERAL AMERICA

OFFICES: Chicago, Louisville, Cleveland, Sharon, Orlando, St. Louis, Salt Lake City, Pittsburgh, Washington, D. C.

sheets and strip, including replacement parts.

"Approximately 8,775,000 tons of sheet and strip steel will be needed to build the anticipated 1948 maximum of 6,500,000 passenger cars and trucks. That tonnage is 46 pct of the expected output of those products from the sheet and strip mills now in operation or under construction. In 1937, about 43 pct of the sheet and strip tonnage went to the automotive industry.

"It is reasonable to assume that sheet and strip mills will have to run at full capacity in order to meet the anticipated demands. Nevertheless, the steel industry should be able to provide the tonnages required by automotive and other consumers, if hindrances to production can be eliminated."

Armour Foundation Opens Electrical Lab

Chicago

• • • **The Armour Research** Foundation has inaugurated a new laboratory of precision electrical measurements which will be at the service of small manufacturers who require precise calibrations. The new unit, known as the Ohmite Laboratory, conceived by Dr. J. E. Hobson, director of the Armour Research Foundation, was made possible by David T. Siegel, president of the Ohmite Mfg. Co., Chicago.

The new laboratory will be operated on a non-profit basis, the work actually being done by electrical engineers rather than laboratory technicians. This arrangement will enable manufacturers of this area to have the benefit of convenient consultation service with the engineers of the laboratory staff.

Operation of the laboratory is under the direction of K. W. Miller, chairman of the electrical engineering department of the foundation. The laboratory has actually been functioning for the past year on a part-time basis. Full schedules could not be planned until the needed equipment was obtained. With the facilities now available, the laboratory will be able to do accurate electrical measurement work on steel and electrical products, and also insulating materials, the makers of which do not have laboratories of their own.

Equipment is available for mak-

ing precise measurements with dc and ac frequency up to 20 megacycles. In addition, the laboratory has facilities for the measurement of conductivity, dielectric constant and power factors, and audio and radio frequency measurements in calibration.

Dr. L. T. Rader, director of the department of electrical engineers, has been appointed co-ordinator between the college and the foundation and will direct activities of the laboratory.

New Approved Dealers Licensed to Expedite Machine Tool Sales

Washington

• • • **From May 16 to 31, inclusive, a total of 207 more "approved dealers" were licensed to solicit and negotiate sales of government-owned surplus machine tools and other production equipment under the agency-dealer plan for such surplus property, WAA has announced. This brings "approved dealers" signed under the government's program to expedite sales of machine tools to a total of 2394 through May 31, WAA stated. In addition, the 33 WAA regional offices had on hand as of May 31 a total of 300 dealer-agency applications in process of screening and approval.**

Cumulative sales of machine tools and certain other items of production equipment sold by approved dealers through May 31 amounted to $68,960,805 (original cost). The government's recovery on these sales was $32,490,557.

Dealer sales of machine tools for the 2-week period May 16-31 amounted to $13,274,977 (original cost), sold for $6,057,028. This is an increase of $4,308,777 over the previous 2-week period of May 1-15 and represents the largest volume of dealer sales for any 2-week period since inception of the program about Jan. 1, 1946. Sales for the May 1-15 period amounted to $8,966,200 (original cost), sold for $4,499,598.

As of May 15, the on-hand inventory of machine tools amounted to $656,658,927, an increase of approximately $17 million over the Apr. 30 inventory and indicating that acquisitions of machine tools declared surplus for sale continue to run ahead of actual sales.

NEWS OF INDUSTRY

May 16-31 appointments of machine tool "approved dealers" are as follows:

ATLANTA

The Jenkins Co., 620 W Jackson Street, Thomasville, Ga.
Bracewell Machinery Sales Co., 224½ Main St., Cedartown, Ga.
Cary Supply Co., 754 Broadway, Macon, Ga.

BIRMINGHAM

Morton Sales Co., 1100 Fairview Ave., Montgomery, Ala.
Stoelker Equipment Co., 913-15 Seventh Ave. N, Birmingham
F. L. Kendig, 913 S 38th St., Birmingham

BOSTON

Surplus Machinery Co., 100 Felton St., Waltham, Mass.
Chase-Hunt-Lamont Corp., 124 State St., Springfield, Mass.
T. F. Byrnes Inc., 27 Woodbine St., Hartford
William J. Gaffney, 116-118 Pearl St., Boston
John J. Tully, Jr., 314 Pine St., Lowell, Mass.
William G. Doherty, Doherty Foundry & Machine Co., Lowell, Mass.
Albert F. Premo, Union Road, Wales, Mass.
The LaPointe Machine Tool Co., 34 Tower St., Hudson, Mass.
Construction Equipment Co., 185 Devonshire St., Boston
Goulding & Co., Inc., 305 Pleasant St., Fall River, Mass.
O'Brien Bros. Salvage Co., 9 Northampton St., Easthampton, Mass.

CHARLOTTE

Longdon Sales Co., P. O. Box 2490, Greensboro, N. C.
Arthur N. Thomas, 116½ East Fourth St., Charlotte
Kidmont Mfg. & Waterproofing Co., Inc., of N. C., 117 Cheek St., Durham, N. C.

CHICAGO

Alter Co., 1701 Rockingham Road, Davenport, Iowa
Fred S. Hickey, 629 Washington Blvd., Chicago
Walter H. Meyer, 605 W Washington St., Chicago
Novak & Rapp, 300 Miner Ave., W Ladysmith, Wis.
Stutz Mfg. Co., 1641-47 Carroll Ave., Chicago
Roy A. Lambert, 3950 N Farwell Ave., Milwaukee
M. Cooper, 215 W Illinois St., Chicago
Surplus Stock & Machinery Co., Inc., 1148 W Lake St., Chicago
Foundry & Industrial Equipment Co., 20 W Jackson, Chicago
L. R. Secrest, 2976 S California, Milwaukee
Industrial Sales Co., 201 N Wells Bldg., Chicago
Emanuel Victor Lansky, 1818 S 49th Ave., Cicero, Ill.
National Industrial Engineering Co., 808 N Third St., Milwaukee
Robert G. Fraser, 6124 N Rockwell Ave., Chicago
Air Control & Development Co., 519 Milwaukee Ave., Chicago
Bascom Engineering Agency, 113 Howard St., Ames, Iowa
Boyd-Wagner Co., 1440 W Lake St., Chicago
Central States Machine Sales Co., 2135 Kishwaukee St., Rockford, Ill.
Clapp, Riley & Hall Co., 14 N Clinton St., Chicago
Globe Machinery Co., 602 W Lake St., Chicago
Grennan & Co., 6936 Oglesby Ave., Chicago
Thomas C. Hardy Co., 224 N Loomis St., Chicago
A. D. Harris Co., 500 40th St., Rock Island, Ill.
Industrial Plants Corp., 316 S LaSalle St., Chicago
McNeil Molding Machine Co., Inc., 1352 N Western Ave., Chicago
Earl J. Martin, 3359 N Ashland Ave., Chicago
A. J. Parelskin, 445 N Plankinton Ave., Milwaukee
Production Engineering Co. of Ill., 4246 Sheridan, Chicago
Production Equipment Co., 604 Wisconsin Towers Bldg., Milwaukee
Standard Battery & Electric Co., 217 W Fifth St., Waterloo, Iowa
Triangle Surplus Property Dealers, 69 W Washington St., Chicago
Walter J. La Forte, 3700 W Polk St., Chicago
Charles B. Sandage Surplus Merchandise, 2321 W Miller St., Indianapolis
A. C. Dunn, Dunning Mfg. & Engineering Co., 3306 W North Ave., Chicago

NEWS OF INDUSTRY

Wabash Equipment Co., 2901 S Harding Ave., Terre Haute, Ind.
Robert F. Bayles, 219 S Sheridan Road, Peoria, Ill.
Monroe Specialty Co., 806 Monroe St., Evanston, Ill.
Knives & Saws, Inc., 516-520 N Cicero Ave., Chicago
Quality Machine & Tool Co., 426 W Main St., Waukesha, Wis.
Tool Engineers, Inc., 3720 W Pierce St., Milwaukee

CLEVELAND

Jones Machine Tool Co., 828-832 E Pearl St., Cincinnati 2
Hird & Son, 429 Rockefeller Bldg., Cleveland
Brokaw Machinery Co., Alms Hotel (Station "D"), Cincinnati
F. Dwight Haigh, F. Dwight Haigh & Associates, 2625 Juniper Drive, Toledo
Frank B. Christian, Biltmore Hotel, Dayton
R. F. Schmitt, 1166 Woodland Road, RFD No. 5, Mansfield, Ohio
J. A. Elliott, Elliott Industrial Service, 1484 Cordova Ave., Lakewood, Ohio
Woodworth Machinery Co., 1298 Jackson Ave., Lakewood, Ohio
Blake Equipment Co., 1550 W Mound St., Columbus
DoAll Dayton Co., 522 N Broadway, Dayton
Chapman Sales Co., 2051 Ashland Ave., Toledo
Fred B. Schutte Machine Co., 184 Stanton Ave., Akron, Ohio
R. F. Williams, 3807 Rotherton Road, Cincinnati
Railway Products Co., 3605 Gulf Bldg., Pittsburgh
Redistribution Resources, 1055 Michigan Ave., Columbus
Capell Sales Co., Inc., 17 S High St., Columbus
Nook & O'Neil, Inc., 10028 Carnegie Ave., Cleveland
Edison Salvage Co., 1529 McKinley Ave., Columbus
E. Ferguson, Jr., 607 National Exchange Bank Bldg., Steubenville, Ohio
T. J. Joyce & Son, 4501 W 148th St., Cleveland
Machinery Sales Co., 403 Tyler St., Sandusky, Ohio
Louis A. Weber, 3286 Maynard Road, Shaker Heights, Ohio
L. R. Zeman, 1765 Balvoir, South Euclid, Ohio
R. M. Pennington, 1363 Bunts Road, Lakewood, Ohio
Michel Machine Sales, 3848 Prospect Ave., Cleveland
The T. E. Wardrope Agency, 1838 E 90th St., Cleveland
G. N. Crawford Equipment Co., 260 42nd St., Pittsburgh
Joseph A. Dosch Machinery Co., 1285 Paddock Hills, Cincinnati
Wright Machine & Tool Co., 403 Mahoning Bank Bldg., Warren, Ohio
Abrasive Tool & Supply Co., 1836 Euclid Ave., Cleveland
National Processing Corp., 848 B. of L. E. Bldg., Cleveland
Dwight M. Davis, 2663 Grasmere Ave., Columbus

DALLAS

Surplus Machinery Co. (Douglas Lown), P. O. Box No. 682, 5125 Bradford Drive, Dallas
Fred C. Stamps, 1031 Strickland, Dallas
Exporting & Importing Co., P.O. Box 2576, Dallas
Todd Shipp, 2830 Lovedale St., Dallas
Coastal Plains Supply Co., 409 Texas Bank Bldg., Dallas
E. E. McLean, 1007 W Sixth St. (Box 203), Brady, Tex.
Lane Mfg. Co., 3725 Mount Everest St., Dallas
Dealers Supply Co., 4172 S Galapago, Englewood, Colo.
Hardin & Coggins, 1717 N Second St., Albuquerque, N. M.

DETROIT

Marvin H. Smith, 912 Lothrop Ave., Detroit
Ned Hills, RFD 1, Gregory, Mich.
Brester Supplies Co., 3295 Lothrop Ave., Detroit
Armstrong Machinery Sales Co., 11627 Klinger Ave., Detroit
Steve Dziadzio, 4072 Cabot St., Detroit
Tool Supply Co., 40 Custer, Detroit
Hunt & Nichols, 510 Michigan Bldg., Detroit
Carl F. DeVore, 1265 Monroe Blvd., Dearborn
Boult's Machine Co., 11850 Kercheval, Detroit
Edmund Machine Sales, 2133 Canton, Detroit

NEWS OF INDUSTRY

Douglas Tool Co., 3750 14th St., Detroit
Material Acquisition, 439 Penobscot Bldg., Detroit
Louis Fritz, 10053 Terry, Detroit
Hargreaves Machine Tool Sales, 6432 Cass Ave., Detroit
H. R. Wright & Co., 424 Book Bldg., Detroit
Gordon C. Heath, 2734 Columbus Ave., Detroit
George J. Stadler Co., 1744 Buhl Bldg., Detroit
H. N. Carpenter Co., 307 Boulevard Bldg., Detroit
Beau-Ben Sales Co., 7861 Intervale Ave., Detroit
George F. Schoen, 3551 24th St., Detroit
Charles K. Clymo, 1250 Calvert, Detroit
George K. Checketts, 33115 Grand River, Farmington, Mich.
Arthur W. Rudel, Clinton, Mich.
David E. Humphries, 8805 Fenkel, Detroit
Rice Engineering Co., 912 Stephenson Bldg., Detroit
Woodmere Scrap Iron & Metal Co., 9101 W Fort St., Detroit
Donald R. Blakeslee, 16760 Lamphere Ave., Detroit
Longyear Machine Sales Co., 1228 Harding, Detroit
Frank J. Asam & Co., 1650 Penobscot Bldg., Detroit
DoAll Detroit Co., 4226 Woodward Ave., Detroit
Empire Machinery Exchange, 12207 Hamilton Ave., Detroit

HOUSTON

Harry M. Dunn Co., 927-A M & M Bldg., Houston
C. G. Forshey, 517 M & M Bldg., Houston
Dye Welding Supply Co., 4515 Fannin St., Houston
Brown Well Service, 2216 Campbell St., Houston
Norvell-Wilder Supply, Drawer 2711, Beaumont, Tex.
R. L. Shroyer Co., 720 Fannin St., P. O. Box 1064, Houston
U. S. Equipment Co., Inc., 1409 McKinney, Houston
Beard & Stone Electric Co., Box 1717, Houston

KANSAS CITY

W. J. Donegan, 616 Benton, Kansas City
W. C. Carolan Co., 936 Dierks Bldg., Kansas City
Guy O. Potts, 615 Ash St., Ottawa, Kan.
Williams Sales Co., City Bank Bldg., Kansas City
Atlas Salvage Co., 229 Southwest Blvd., Kansas City
Machine Products Co., 148 N Water St., Wichita, Kan.
Airplane Salvage Co., 3055 N Broadway, Wichita, Kan.
U. S. Mercantile Co., 825-827 E 18th St., Kansas City

LITTLE ROCK

Fagan Electric Co., Inc., 901 Spring St., Little Rock, Ark.
Wooley Electric Co., 924 E Third St., Little Rock, Ark.
Hawkins Lumber & Machinery Co., 3719 W Markham St., Little Rock, Ark.
Industrial Equipment Co., 3225-3325 Arch St., Little Rock, Ark.
R. A. Young & Son, Fort Smith, Ark.

LOUISVILLE

Falls City Sales Co., Box 776, Louisville
Household Appliance Co., 639 E. Main St., Louisville
Sherman Brothers Mill, 222 S Shelby St., Louisville
Wiltse & Wiltse, Box 207, Bardstown, Ky.
Danville Hardware & Supply Co., Perryville St., Danville, Ky.
Bacon's Machine Shop, Broadway, Frankford, Ky.
Covington Forging & Mfg. Co., 900 Church St., Bowling Green, Ky.
Cayce Mill Supply Co., 304 E Ninth St., Hopkinsville, Ky.
Howard E. Shelton, Box 1034, Paducah, Ky.
Joe Leasure & Sons, N Madison Ave., Madisonville, Ky.
Farmers Supply Co., 119-123 N Elm St., Henderson, Ky.
Wright Machine Co., Inc., 321 E Second St., Owensboro, Ky.
Volmer Electric Co., 939 E Maple St., Jeffersonville, Ind.
Labon P. Jackson Co., Eminence, Ky.
Brandeis Machinery & Supply Co., Inc., Brook & Warnick St., Louisville
Ira Watson Hardware Co., 29 E Wardell St., Scottsburg, Ind.
Seymour Tool & Engineering Co., Ninth &

Ewing Sts., Seymour, Ind.
Bedford Foundry & Machine Co., Inc., Fifth & Monon Railroad, Bedford, Ind.

NEW ORLEANS

Alexandria Sales Co., 3306 Third St., Alexandria, La.

NEW YORK

Air Compressor & Pump Corp., 111 Eighth Ave., New York
W. R. Blackburn & Co., 92 Liberty St., New York
A & M Blank Co., Inc., 49 State St., Paterson, N. J.
J. P. Callahan, 8731 90th St., Woodhaven, N. Y.
Culver Welding & Engineering Co., 1329 36th St., Brooklyn
Fairfield Equipment Co., Fairfield, Conn.
Sylvan Greenbaum, Wythe Ave. & No. 13th St., Brooklyn
Kaiser-Martini, Inc., 449 E 86th St., New York
Thorne E. Lloyd, Netcong N. J.
Loudee Iron & Metal, 30 Church St., New York
Metal & Ore Corp., 1684 Woolworth Bldg., New York
R. C. Neal Co., Inc., 76 Pearl St., Buffalo
Pariser Electric Motor Co., Inc., 165 Centre St., New York
Stanley Ranzenhofer, 51 Chambers St., New York
Adolph R. Schuman, 3120 Buhre Ave., New York
Wayne Motor & Equipment Co., 372 Union Ave., Paterson, N. J.
Arnessen Electric Co., Inc., 116 Broad St., New York
Jack Ewart, 113 E. 138th St., New York
Moffett Procurement & Sales Co., 17 E 42nd St., New York
N. B. Payne & Co., Inc., 105 W 55th St., New York
Rupp Equipment Co., 101 Great Arrow Ave., Buffalo
Stern Sales Service (Sidney S. Stern), 25 Mt. Airy Road, Bernardsville, N. J.
Tunnel Machinery Exchange, 2 Wooster St., New York

OKLAHOMA CITY

Welders Supply Co., 420-22 S Walker, Oklahoma City

RICHMOND

Acme Engineering Co., 426 Rittenhouse St., NW, Washington, D. C.
Bemise Equipment Corp., 2219 Chamberlayne Ave., Richmond, Va.
Robert P. Leonard, 820 Connecticut Ave., NW, Washington, D. C.
The Ben Sowers Co., Princeton, W. Va.
Allied Procurement Corp., 966 National Press Bldg., Washington, D. C.

SAN ANTONIO

Wesley Hall, 134 Fifth St., Weslaco, Tex.

SAN FRANCISCO

Industrial Electrical Service, 2312 Ninth St., Berkeley, Calif.
Thompson-Sage, Inc., 821 S Wilson Way, Stockton, Calif.
Lewon & Gates, 5238 Mission St., San Francisco
Richard A. Scherer, 1770 Pine St., San Francisco
R. D. Adams, 555 Post St., San Francisco

Sealed Bid Sale Held

Pittsburgh

• • • **Steel pipe,** well casing and railroad spikes was offered by the War Assets Administration in a sealed bid sale, G. G. Yule, district mgr., WAA, has announced.

The government-owned surplus consists of 250,921 ft of steel pipe grooved for victaulic couplings; 2340 ft of threaded steel casing, 8 in. in diam, in 10-ft lengths, and 440 kegs of railroad spikes packed in original kegs. This material represents approximately $150,000.

The material was inspected June 20 to July 2 at the Pennsylvania Railroad yards at Latrobe, Pa.

Weekly Gallup Polls

(CONTINUED FROM PAGE 101)

which the South is a one-party section.

	1932 Pct	1936 Pct	1940 Pct	1944 Pct
Alabama	86	87	86	82
Arkansas	87	82	79	70
Florida	75	76	74	70
Georgia	92	87	85	82
Kentucky	60	59	58	55
Louisiana	93	89	86	81
Mississippi	96	97	96	93
N. Carolina	71	73	74	67
Oklahoma	73	67	58	56
S. Carolina	98	99	96	95
Tennessee	67	69	68	61
Texas	89	88	81	81
Virginia	70	71	68	63
All South	76	76	73	69

•

• • • **The troubles of** the Supreme Court, highlighted by the Jackson-Black feud, have lowered the dignity of the Supreme Court in the eyes of many people.

A coast-to-coast poll just completed by the institute shows that about a third of the country's voters have changed their attitude toward the Court of late, and that the overwhelming majority of those who have changed their attitudes say they now have a lower regard for the nation's highest tribunal.

Furthermore, a very substantial number of voters — a majority of those with opinions on the subject —think that the Court decides many questions largely on the basis of politics, rather than on a purely legalistic basis.

The sounding of sentiment took place on three questions as follows:

"Has your attitude toward the Supreme Court changed in recent years?"

The vote:

	Pct
Yes	30
No	45
No opinion	25

All those who answered "yes" to the above were asked:

"Do you have a higher regard or a lower regard for the Supreme Court now?"

The vote:

	Pct
Higher	3
Lower	27
	30

All voters were asked:

"Some people say that the Supreme Court decides many questions largely on the basis of politics. Do you agree or disagree with this?"

The vote:	Pct
Agree	43
Disagree	36
No opinion	21

With the "no opinion" excluded, the vote on the above question would be: agree 54 pct, disagree 46 pct.

The questioning in the poll brought out the fact that the chief criticisms of the Court are (1) too much bickering and feuding, as shown by the Jackson-Black quarrel, (2) too much playing of politics on the bench, and (3) criticisms of the caliber and standing of the men appointed to the court in recent years. Some of the voters who gave the latter criticism said it was because the late President Roosevelt "packed the court with his favorites."

For decades the Supreme Court held a very high place in public esteem. One indication of this fact was the attitude of the public at the time when President Roosevelt, in 1937, sought to enlarge the number of Justices through his now famous Supreme Court bill. Congress finally shelved the bill after bitter debate and controversy.

President Roosevelt had just won, in the 1936 election, the most overwhelming victory of any presidential candidate for more than half a century, yet when he attempted to enlarge the Court so that the majority of Justices would be closer to the views which he espoused, the voting public, including many who had fought for him, did not support the move.

At the beginning of the fight sentiment was about evenly divided on the plan, but by the time the controversy ended the public's vote was 3-to-2 against the change.

London Economist

(CONTINUED FROM PAGE 105)

Malenkov. Of these the first, Stalin, is also chairman of the Council of Ministers, and six others, Molotov, Andreyev, Voroshilov, Kaganovitch, Mikoyan and Beriya are vice-chairmen; three of them also hold portfolios—Molotov (Foreign Affairs), Mikoyan (Foreign Trade) and Kaganovitch (Building Materials Industry). This overlapping of membership between the Politburo and the Council of Ministers is sufficient to ensure that the instructions given by the for-

mer are properly carried out by the latter.

IN SPITE of the permanent legal monopoly of political activity which the Constitution of the Soviet Union confers on the Communist Party, the distinction between party and state functions is carefully maintained and there is a very important category of persons who play leading parts in party affairs without being prominent as holders of state offices. These must be taken into account in assessing the reality of political power in the Soviet Union. It is not only a question of the Politburo. The Politburo decides policy, but co-equal with it are two other organs, the Secretariat and the Orgburo, to which the Party Central Committee likewise delegates functions and which are of even greater importance for access to the levers of power.

The Secretariat now consists of five members, the Orgburo of 15, and all the members of the Secretariat are also members of the Orgburo. In practice, therefore, the Orgburo is simply an extension of the Secretariat, and in its business of approving or disapproving all promotions and appointments of party members, whether in party or state organs, it is dependent on the dossiers compiled by the Secretariat. The Secretariat, with its tight control over the whole organization of countless local party secretaries, really determines the relations of power within the party. Stalin built up his personal power as Secretary-General and he retains this position with the modified title of First Secretary.

Three men only are concurrently members of the Secretariat, the Orgburo and the Politburo. They are Stalin, Zhdanov and Malenkov. These are the Party "bosses" *par excellence.* But whereas Stalin is also Chairman of the Council of Ministers and Minister of the Armed Forces, neither Zhdanov nor Malenkov appears among the ministers. Zhdanov, however, is Chairman of the Supreme Soviet at its infrequent sessions and Malenkov is one of the 33 members of the Presidium of the Supreme Soviet.

As the Party permanently and exclusively controls the State, it follows that those who have power over the Party have also power over the State. Nevertheless, caucus control can never be quite

automatic, for the holders of key state offices may attain a certain independence, particularly those who have the direct administration and command of the armed forces and the police. Ever since his rise to undisputed political leadership of the Communist Party, Stalin has had to find means of keeping effective control over both the Red Army and the secret police organization (formerly the GPU, known more recently as the NKVD) with its special military formations. For control of the army he used to rely on his old friend Voroshilov, who was made War Commissar in 1925 and retained the office until 1940. But Voroshilov's military ability was never equal to his loyalty to Stalin; he lacked prestige among the generals, most of whom before 1937 looked to the far more distinguished Tukhachevsky for leadership.

The unrest in the Army might have resulted in the overthrow of Stalin by a *coup d'etat*, but was crushed by ruthless purging; at the same time disaffection was discovered in the ranks of the secret police and they also were purged. Yezhov, the most fanatical of Stalinists, was brought in from the Secretariat and put at the head of the NKVD; he carried out the purging with frightful thoroughness, but the horror he inspired, even among the most loyal Stalinists, was so great that Stalin soon relegated him to obscurity and replaced him with the more genial, though not gentle, Beriya. Meanwhile Voroshilov continued to rule over the purged army, but in 1940 urgent military need caused Stalin to transfer the War Commissariat to a more competent, but politically less trusted soldier, namely, Timoshenko.

Then came the German invasion and Stalin himself took over the supreme military command. It seems that previously, not being a professional soldier, he had been reluctant to assume such a responsibility, but in the crisis of 1941 it was plainly indicated, for defeat would in any case destroy his power, whereas the credit of victory would accrue in the first place to the commander-in-chief. Victory was achieved and Stalin earned the titles first of marshal and then of generalissimo. He is now formally Minister of the Armed Forces and Supreme Commander-in-chief. He commands the

armed forces, not as a civilian politician, but as a soldier, a Marshal among his Marshals. Having controlled the Party machine for two decades, he has obtained, as never before, a sure control over the Army; at the same time he confronts his civilian colleagues with an increased authority because of his military leadership.

With the loyalty of the Army assured, he is less dependent on the secret police, and can afford to split up their vast and potentially dangerous organization. Their wartime chief, Beriya, has been relieved of his post, honored for his services with the title of marshal and appointed to membership of the Politburo, while the functions of his old Commissariat have been divided between the Minister of Internal Affairs (Kruglov), State Security (Merkulov), and State Control (Mekhlis).

Stalin keeps the military and political hierarchies strictly apart. None of the professional soldiers who have made their names famous on the battlefields of the late war are permitted to hold important political offices. Their rewards are of a different kind. It has been decided that a marshal's ceremonial sword is to be adorned with 98 rubies, 140 chrysalites, and two large topazes; several of the marshals can also exhibit the splendid diamonds of the Order of Victory. They form a magnificent social *elite*, but politics are banned for them, and they remember that three Soviet marshals have perished from eating of the forbidden fruit.

The unimpaired authority of the Communist Party and the absence of professional soldiers in high political place have apparently belied the expectations of those observers who thought that the Army would play a preponderant political role in postwar Russia. Nevertheless, it should be emphasized that Stalin can control the proud conquerors of Berlin and Vienna because he is of their company, because he led them to victory; they are today submissive to their glorious Generalissimo, but if he were to pass from the scene, it may be questioned whether they would give similar obedience to a mere civilian.